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Gleanings in Bee Culture

Vol. XLIV JUNE 1, 1916 No. 11

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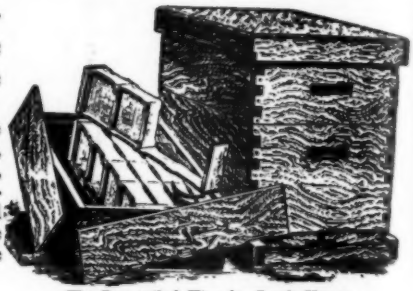

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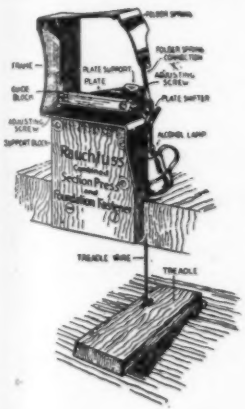

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The High Price of Sugar

SUGAR is already up to 8½ cts., and there is a prospect that it will reach 10. While sugar is expensive, the price of sugar will naturally have a boosting effect on the price of honey.

Winter Losses in New York

LATE reports from New York indicate that the winter losses are more severe there than elsewhere in the country. Our revised reports will stand about as follows: Winter losses in Montana, parts of Canada, and New York. There were scarcely any losses reported elsewhere except as a result of starvation. The high price of sugar and the open winter are responsible for this.

Fruit-bloom in and about Medina

PROSPECTS were never better for a good yield from fruit-bloom during the first week in May this year. Just as the bloom had opened at its height, and when the bees were storing fruit-bloom heavily, a cold rainy spell, as noted elsewhere, set in. In the mean time the bloom disappeared; but, fortunately, the weather maps show that in and around Medina it was much colder than in almost any other part of the United States.

The California Situation

THE *Western Honeybee*, after gathering together a bunch of reports from various parts of the state, thus summarizes the crop conditions:

> The orange-honey crop of the citrus sections of the state has been less than was expected, only about two-thirds of an average yield having been harvested. The season was unusually early, having ended before May 1. The new crop is of fine quality, and has already been nearly all picked up by the shippers and local buyers, mainly at 6 cents. A moderate crop of sage is being taken in most localities of the sage belt, but will be shortened by lack of spring rains. Little damage is reported from the sage weevil. Grasshoppers are doing some damage to alfalfa in Imperial Valley, but most of the alfalfa sections will probably harvest a fair crop. Some damage from brush fires has already occurred in the southern counties.

A Long Journey for a Large Piece of Wax

OUR cover for this issue shows an unusually large piece of wax that was shipped clear from California without being broken, with nothing for protection but two thicknesses of burlap. The weight of the cake was 266 pounds.

For shipping beeswax, burlap sacks are better than wooden boxes, for they are lighter, and the wax is more likely to reach its destination in good condition. Usually, however, it is better to use two sacks, one inside the other, so that in case there is a weak spot in one sack the other will furnish the strength. Unless the sacks were in very bad condition it would not be likely that two weak spots would occur at the same place.

The New Edition of the A B C and X Y Z of Bee Culture

WE are working almost night and day in preparing copy for the new edition of the A B C and X Y Z of Bee Culture. A large number of the articles are being entirely rewritten. In addition many new subjects are being added. The A B C and X Y Z is in reality a collection of monograms, each article being complete in itself. Each of the monograms has many cross-references back and forth, so that practically everything known on a subject can be gathered.

During the past three or four years many new methods and ideas have been developed, and these are being carefully incorporated into the old matter. The chapter on European foul brood has been entirely rewritten and the revised copy has been submitted to the best authorities in the United States for correction. Alfalfa and sweet clover have received an entirely new treatment. Extracted Honey and Bottling Honey have been entirely revised.

XUM

When the work is completed it will contain between 900 and 1000 pages, and will be sold at $2.50; but in the meantime all orders up to September 1 will be accepted at $2.00, because the old edition will be exhausted within a month or six weeks.

Clover Prospects

THE United States Weather Bureau maps show that thruout the clover area of the country there has been a large amount of rainfall. Clover was already in prosperous condition, and recent rains had given it another big boost. Unless we have a very severe drouth and cold weather during the latter part of May and the first of June a big crop of clover is almost assured. Reports from all over the clover districts confirm the Weather Bureau maps. The question now is, "Are beekeepers ready?" It is a fearful mistake to be only half prepared and then get only half a crop when a whole crop might have been secured by having proper appliances on hand ready for the flow.

Long-range Weather Predictions

UP till very recently, at least, the United States Weather Bureau has given out that it could not make accurate predictions very much beyond 48 hours; but recent developments have taken place, showing that in some cases, at least, the Bureau is able to forecast the weather for a week in advance. In our locality, for example, last Saturday, May 13, the Bureau sent out the report that in northern Ohio there would probably be a week of bad weather—cold and rainy, interspersed with sunshine. The Sunday following was beautiful, weather hot, and it looked as if the prediction were considerably strained. Monday began to show rainclouds, but it was warm. Then it began to turn colder, and for nearly a week we have had bad weather, just as the Bureau predicted.

Shipments of Bees in Combless Packages and How they can Make the Difference between Profit and Loss

THIS is, apparently, getting to be quite an industry in the United States. Many shipments are constantly arriving from the South to boost colonies in the North below par up to honey-gathering pitch. The thing works out nicely, because the Southern producer, after his crop is secured, can ship to the Northern producer the bees that would otherwise be useless consumers, but which, when sent north, are ready for business again. While the Southern-shipped bees may die before the beginning of the Northern harvest, they help immensely in making more brood possible, and of course a large force of young bees of the right age for a crop.

The value of these pound shipments will be better understood, perhaps, when it is remembered that a colony slightly below honey pitch will do but little more than hold its own. A little boost of a pound or two pounds of bees early enough will make all the difference between a good surplus and no surplus. A colony that does no better than hold its own is a dead weight on the business.

Those who have colonies that are below par would do well to consult our advertising columns, and other things being equal, purchase of the nearest man who has combless bees for sale.

Dr. Nelson's Book

WE beg to call attention to the sketch by Doctor Nelson on the development of the bee egg, on page 447 of this issue. Until Doctor Nelson finished his job, we were without any reliable account in the English language of this interesting and important part of the life of the bee, and the accounts published abroad were all old and out of date. The changes which occur in the egg are very intricate, and a whole volume is necessary to describe them. The article to which we would call the reader's attention is only a brief sketch, but it may at least awaken in our readers an interest in this part of the bee's existence which has been to most of us a sealed book.

Our readers may be interested in knowing that, in addition to the commendatory notices of Doctor Nelson's work which have appeared in the beekeeping press, this work has been favorably received by such journals as *The Canadian Entomologist*, *Entomological News*, *The Journal of Economic Entomology*, *Science*, and *The Nation*, on this side of the Atlantic; in England by *Nature*, and *The Entomologist's Monthly Magazine*, and by *Miscellanea Entomologia* in France.

Bees — How Long Can They Remain in a Chilled Condition and Revive?

ON page 416 of our last issue, Mr. H. F. Bohon reports a rather interesting case of how he discovered that the bees of one of his colonies had starved and dropped down on the bottom-board and lay there in a chilled condition, apparently dead. He picked the queen up and carried her to the

house, and was surprised later on to find she had revived. Thinking that the bees might follow suit he scooped them up and brought them in, and they, too, revived. He fed them sweetened water, and they seemed to be as well as ever.

Bees will remain in a chilled condition for several days, as we have proved by experiment; but we have never had them last longer than ten days, because, apparently, they starved to death while in that condition.

The presumption is, in the case cited by Mr. Bohon, that the bees dropped from the combs from sheer exhaustion resulting from a want of food. A cold spell came on, and they chilled while in that condition. It was a case of what might be called suspended animation. Mr. Bohon happened to come around at the strategic time, and warmed them up and fed them. They would not have survived much longer probably.

Bees suddenly chilled in a zero atmosphere will die, while bees gradually chilled and gradually warmed up will sometimes survive. How low a temperature they will stand we do not know; but we do know that a *sudden* chilling kills them.

There are some interesting problems in connection with this matter; but from present data at hand it is apparent that Nature has made it possible for bees to be chilled thru and remain in that condition for several days. A warm spell coming on, the bees revive and move on to fresh stores.

Stirring up a Hornet's Nest; Legislation too Drastic

WESLEY FOSTER, in his department in this issue, expresses himself in favor of legislation "prohibiting the shipment of comb honey and extracted honey from an infected apiary." He thinks it is doubtful whether such a law could be enforced, but believes we "shall have it sooner than many of us think." He admits that "it will cause a *furore*, the like of which the hubbub over the net-weight law will be tame."

Right you are, Bro. Wesley. If your program can be carried out you surely will stir up a hornet's nest, or, more exactly, a "*furore*" among your fellow beekeepers. We doubt if such exclusion of honey shipments would be wise. Here is a beeman who has $2000 invested; and if he cannot ship any honey out of his apiary for a whole year or longer because he is cursed with careless neighbors, he might as well apply the torch to the whole business. Moreover, neither European nor American foul brood is a serious menace to the up-to-date beekeeper. He can keep them under control—the European by the introduction of resistant strains, and by dequeening, and the American by shaking. Indeed, there are not a few progressive beekeepers who feel that foul brood is a blessing in disguise, because it eliminates from the neighborhood the careless or irresponsible, leaving only the "survival of the fittest."

In the same way, we doubt the wisdom of legislation that prevents the shipment of combless bees or queens in interstate business. The man it would hit the hardest is the producer, not the queen-breeder, because the latter can produce honey.

A bill that would meet the strenuous opposition of a considerable number of beekeepers could hardly pass any legislature. Our law-makers, if past experience is any criterion, will not pass any act unless it can have the *undivided support* of those *in whose interest it is made*. Several of the states would have good foul-brood legislation today were it not for the opposition of a very small minority of beekeepers.

There is also danger of "reciprocity legislation" that would virtually work out a boycott, provided one state passes legislation that would be hostile to another. It is a dangerous proposition at best. If the other states should retaliate against Colorado that seeks the market of the country it would be serious business. Colorado must and should have the markets of the world for her honey.

The interests of beekeepers can be adequately safeguarded by a federal law requiring that all shipments of combless bees and queens by freight, express, or mail be accompanied by a certificate of inspection, or a sworn statement to the effect that the honey in the food has been boiled to conform to the requirements of the Postoffice Department. Such regulations, so far as queen bees are concerned, are already in force.

Wax Production a Specialty, Not a Side Line

IN countries where honey must be shipped long distances to a market so that the net price which the beekeeper receives is therefore low, there has been much speculation regarding plans for turning such honey into wax. When we received a request for a special number on wax production we hoped that we might be able to get reports from beekeepers who were actually doing this very thing, making a specialty and not a side line of wax. We are not able to present as much information on this particular part of the subject as we had hoped.

XUM

In this connection there is a very interesting chapter on this subject in a bulletin by Dr. E. F. Phillips, No. 75, Part 5, of the Bureau of Entomology, entitled "A Brief Survey of Hawaiian Beekeeping." We quote here in full what is given in regard to wax production.

The price of honey fluctuates relatively much more than that of beeswax. On account of the fact that Hawaiian honey has been selling for a low price, and also because of the peculiar character of most of the honey, the beekeepers of the islands are desirous of converting their honey into wax, if it can be done, even at no great profit. The long shipment necessary to get their honey to market means more or less loss by leakage and heavy freight. Wax does not lose anything in transit, and naturally, also, wax weighs much less than an amount of honey of equal money value, and the freight would be very much reduced.

When the author arrived on the islands one of the first questions asked him was how to bring about a production of more wax and less or even practically no honey. After getting the available data, which were freely given, a method was suggested which promises to give some results, if we may judge by results obtained in some experiments conducted in the short time which could be spent in Hawaii. Before outlining this proposed method it will be well to review the basis for the recommendations.

It is a well-known fact among beekeepers that at the time a swarm is hived the activity of the inmates of the new home is at its height. The bees not only collect nectar with great vigor, but, there being no wax in the hive under natural conditions, the wax-secreters become very active, and in a marvelously short time the hive is supplied with combs. It is also true, of course, that wax is secreted at any time during the active season when it is necessary that more combs be built to accommodate brood or stores, provided, of course, there is room. If a comb is removed from the center of the brood-chamber or from the super, it is replaced as needed, but, as a rule, not so rapidly. The rapidity of the honey-flow influences this wax secretion greatly.

The amount of honey consumed in the secretion of a pound of wax is a much-debated question among students of bees, the various estimates ranging all the way from 2 to 20 pounds. There seems to be little hope at present of arriving at anything definite on this question, and the author is strongly inclined to the belief that the reason for this great variation in estimates is due to the fact that the same amount of honey is not always needed to bring about a desired result. It would be bootless, therefore, to pay any attention to this phase of the question in trying to get a method of wax production. Sylviac, in a series of articles in L'Apiculteur for 1901, offers evidence that the amount of honey consumed in secreting a pound of wax is least following swarming, and this quite coincides with the fact that wax-building is most rapid at that time.

In dealing with wax secretion on a commercial basis, data must be drawn from the receipts per colony under different methods of management. The actual consumption of honey becomes of minor importance. It was learned that the average annual return per colony, after deducting freight charges, leakage, and other expenses incurred after the honey leaves the apiary, would not exceed $2.50. The hives are on an average two stories high during the entire year, and, during the height of the honey-flow, are often higher. All figuring was done on a basis of two-story colonies. The wax in such a hive weighs over 6 pounds, averaging in value $1.80, Hawaiian wax being of the finest quality.

As additional data, it was learned that it is possible to increase the number of colonies very rapidly. In one remarkable case reported, 20 colonies were increased to 420 in eight months. This fact shows that a colony of bees can build up very rapidly under the conditions existing on the islands. It must also be remembered that in cane sections there is practically no stopping of the honey-flow.

In view of all these facts it was obvious that, if the wax be taken from each colony, it will form a good beginning in the annual return from a colony. If, then, the colony is in as good shape in a year's time as it was when the wax was removed, there will be honey enough stored to make the annual money return higher than if the colony had been run for honey alone.

The method recommended is to shake the colony on to starters of foundation. The brood is placed over another colony to develop so that it may not be lost; the honey is to be extracted. By dividing the apiary into two parts, one half may be shaken and the brood piled on the other half. These in turn may be shaken in three weeks or more, and their brood added to the colonies shaken at first. This manipulation is identical with the shaking in treating for bee disease. Similar methods are often employed in honey-producing to prevent swarming and to cause bees to work in the supers. In the present instance, however, there is an entirely different reason for the practice.

In the trial made with a view to wax production, a surprising showing was made, and it seemed obvious that the operation could be repeated in not more than three months' time, and probably less. If this be true, then there will be removed $1.80 worth of wax or more at each shaking, which means a considerable gain.

No positive statements of results can be made until the method has stood trial for a time. If this plan serves the purpose in Hawaii, it will also be valuable in other regions where there is a heavy honey-flow for a long time.

Dr. C. C. Miller

STRAY STRAWS

Marengo, Ill.

CHARLES E. KINZIE gives, page 401, a kink worth noticing. He keeps always in the first story of extracting-combs combs partly filled with honey *in the center*. If a simple thing like that will prevent the forming of a brood-nest there thus saving the use of an excluder, it's well worth while.

J. E. JORDAN, you say, p. 413, you graft larvæ 24 hours old, and then say, "Cells should hatch 12 days after grafting." Are you not going by traditions rather than your own observations? With best conditions for queen-rearing should there be as long a time as 16 days from the laying of the egg to the emergence of the queen? [See reply to another straw on this page.—ED.]

THAT illustration, p. 376, showing that it has not yet "all been done" in the way of improved machinery, applies also to bee-keeping. Advance has been made that seemed impossible 25 years ago; some things have happened that are hard to believe even now, and the next 25 years may show even greater advance. Young fellow, keep your eyes open. Who knows but you may be the one to stumble upon something valuable?

ARTHUR C. MILLER, p. 366, says bees sometimes put honey in a cell that contains an egg. That's a new one. I never saw anything of the kind, so that proves he's wrong. But my testimony is like that brought in a case where three witnesses swore to seeing a man commit a crime, and he brought six witnesses to swear they *did not* see him do it. Anyway, I'd like to know if it's a common practice, and just how we can prove it on 'em.

J. E. CRANE says, p. 359, that removing brood is much more effective when first preparations are made for swarming, and the longer it goes the harder to stop them, until sometimes they'll swarm with all their brood taken away. Sounds strange, but it's true. Once I kept thwarting and thwarting a colony by taking away brood, but not enough at first, and finally it swarmed, leaving in the hive only foundation with just one egg, and that in a queen-cell.

SEVERAL of the interesting plans for prevention of swarming given by R. F. Holtermann, p. 404, have as a chief factor an old plan that every now and then bobs up as something new. It was given years ago by G. W. Demaree, Christiansburg, Ky. (I wonder if he's still alive), and is this: Put all the brood in a second story over an excluder, leaving the queen below with drawn combs or foundation. That's all, I think that Mr. Demaree gave but it's considered better to leave one brood below. Unfortunately it cannot be worked with section honey.

H. H. ROOT, I'm glad your sharp eyes are searching out things new and old in the hive. That starting queen-cells from drone-cells, apparently with drone brood in them, with plenty of young worker larvæ present, I would have supposed impossible. I wonder if you could have it repeated, and then let the cells go on to a finish and find out whether or not the drone larvæ were exchanged for worker larvæ.

That colony chose drone-cells rather than to use worker larvæ away from the edge, yet not two hours before reading your article I saw in a normal colony a cell cup built right in the center of the comb, apparently upon the sealed surface of worker brood. Perhaps it was because of continuously cold weather, so the edges were too cool. But why build cell cups at all at such a time?

Isn't there something a bit askew with your figures where you gave larvæ, and say "From six to eight days from the time the bees took hold of the work the cells are capped over?" I've known cells sealed in less than five days after the larva left the egg, but does it ever happen in more than five days?

[Mr. Mell Pritchard has reared towards 20 thousand queens, and is a very close observer besides. I have just shown him my figures on page 403, and your comment. He says that it takes 15 to 17 days from the time the egg is laid for the queen fully to develop and emerge from the cell. Dividing up the shorter period, 15 days, he gives 3 days for the egg to hatch, 6 days for the bees to feed the larva, and 6 days for the cell to remain sealed. If the weather is unfavorable, so that 17 days are required, the periods are lengthened. According to Mr. Pritchard, therefore, it is 5 days after the larva is grafted before it is sealed, since the average larva is about 24 hours old when grafted. Apparently, therefore, the truth lies between your statement and mine—tho I'll have to admit that you are nearer to it than I. However, this does not surprise me, for you have been keeping bees toward 75 years and you ought to know better.—H. H. ROOT.]

Grace Allen

THE DIXIE BEE

Nashville, Tenn.

Locust came, with all its inviting sweetness, in late April, and white clover so early in May that they lapped. Right now (mid-May) the honey prospects are very bright, tho of course city backlotters always remember their limited pasturage and keep their expectations modest.

• • •

Prof. Baldwin, it was long before you came into the GLEANINGS family that I wrote my protest against your advocacy of the separate-shelf policy. Now I do most heartily join my welcome to the others, and hope you will make yourself at home on any shelf whatsoever in the apiarian library.

• • •

Dr. Miller, I wish you could see me working among the bees this spring, for I do it sitting on a new really-truly hive-seat, apparently thru forever with merely kneeling by the hives. And I admit it is comfy. Along with the other useful things stored away in the yawning boxes on either side I keep a note-book and pencil, and jot down different memoranda as I go—like this.

• • •

Those moldy north-side combs, mentioned May 1, are all cleaned up now and filled with either honey and pollen or honey and brood—all, that is, but one. That one the record of March 24 refers to as "*very moldy.*" And on May 14 about two-thirds of it has disappeared, evidently cut out and ground up, for on the bottom-board beneath was a thick deposit of fine, dry, brown powder.

• • •

What Dr. Phillips is reported as saying about the beekeepers of the South Atlantic states, page 259, April 1, reminds me that right here in enlightened Nashville, that calls herself the "Athens of the South," because of her many schools and colleges, a young lady who was recently told that we kept bees mentioned with considerable interest the necessity(!) of informing the bees of the death of any member of the family. Amazed, but certain that she must be playing, I replied that as we had no deaths, I was unfamiliar with either the requirements or custom or etiquette of the occasion in its relation to the beeyard. Whereupon she solemnly assured me of the genuine necessity of this procedure!

• • •

When I quoted, page 263, April 1, from the letter of Mr. O. J. Jones, giving his method of clipping queens, I liked the way it read, but had not yet tried it. Now that I have tried it, I like it still better, for it works beautifully—more easily, for me, than the more orthodox method first mentioned, the one I had always used till this spring. Of course if ever a queen should pull away, minus a foot or two, left between my grasping thumb and finger, I should be greatly distressed. But so far no such catastrophe has occurred. Not only did I somehow do it with far less nervousness than previously; but the queens themselves took it with entire matter-of-factness and coolness, two that I watched going right on laying as soon as returned to the frame, tho one of these did act a trifle flighty, perhaps, for she deposited her eggs on top of sealed brood and on the edges of cells and just anywhere at all. I watched a worker take up one of these misplaced eggs with her antennæ; but before she had a chance to carry out her plan, puff! came a little breeze, and the tiny egg blew quite away.

• • •

Claiming Life's Flowers

(Written after a recent illness—hospital, operation, etc.)

Around my quiet days and hours
My joys were blossoming like flowers,
Flowers of love and deep content
And shy, quaint flowers of wonderment.
One by one I drained their sweet,
So close they grew about my feet.

Then sharp across one startled day
A sudden voice from far away
Came shrilling; and at once I knew
Some field where strange, wild flowers grew
Had bloomed, and called, and I must go,
Like bees when clover blossoms blow.

Dread—dread—grew there; but, close beside,
Courage, erect and laughing-eyed,
Pain, and the will to smile at pain,
And love of life thru sun or rain;
While in their midst, with haunting breath,
Blew eager fearlessness of death.

And here my gay bravado shrank;
And yet I drank—aye, deep I drank,
Of every drop my soul could press,
Whether from joy or bitterness.
(I want the flowers by the friendly wall
And the brave wild flowers and the thorns
and all!)

Today I watch my bees take flight,
Unafraid across the light,
And pray my heart may never quail
In its quest for something akin to the Grail—
A glory in life and the grace divine
To drain each drop like holy wine.

BEEKEEPING IN CALIFORNIA

P. C. Chadwick, Redlands, Cal.

It is not generally known that there are two varieties of wild buckwheat, one of which blooms several weeks in advance of the other.

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Bro. Baldwin, I greet you as a department editor. Were it my privilege to assign you a task I would give you the problem of introducing a bee into your state that would fly more than 1¼ miles for nectar.

• • •

And now comes Allan Latham openly confessing that the much-famed "let-alone plan," of which he is the originator, has failed. Foul brood is given as the cause of failure, which I think would make it a shaky plan in many parts of this land. We must admire Mr. Latham's thought in working out the plan, if nothing more, for he really has made many of us think new thoughts.

• • •

Every season for the past twelve years we have been handicapped by fogs during April and May. We have long hoped that a time might come when these conditions would not prevail. This year we were spared the fogs, with the result that the moisture escaped more rapidly than ever. I have been guilty of condemning the weather in past years; but from this time on I shall try to be satisfied with it as it comes.

• • •

I have been watching closely the work of bees on the orange to prove the idea (my idea) that they gather pollen from the navel orange. Well, I give up; there seems to be none there. Mediterranean sweets, St. Michael's, Valencias, and the common unbudded seedlings, have all yielded pollen under my eyes; but the navel, none. So, in the future, when the orange-grower asks me how many bees would be necessary to pollenize the navel groves of Redlands district, which comprises about 10,000 acres, I shall be compelled to say that one colony will be sufficient.

• • •

When I read the article of George H. Rea on black brood and his treatment of it I thought of my mother who, years ago, in administering to my ailments with some medicine to which I raised objections, would say, "Well, if the remedy is worse than the disease you will have to get along awhile." Mr. Rea's remedy is surely vigorous treatment, and I doubt if it is altogether necessary. *Melting* up all infected brood-combs, to my notion, would be sufficient. Mr. Rea says, "Combs containing diseased brood, if bad, are burned." There is where I disagree most emphatically. Why burn any thing of value about the apiary?

• • •

I am a friend of the excluder, believing it to be a necessary appliance; but this season, for the first time, I believe they have been a detriment to my honey crop. It was not exactly the fault of the excluders either—more the fault of myself in getting in a hurry to confine the queens to the brood-chamber, when the immense flow of nectar and the small force of bees so early in the season left no room for brood-rearing. The force of bees, as I have said, was too small to operate in all parts of the hive at the same time. If I had left the excluders off I feel I should have had more brood early, consequently more bees now for the harvest at this date, as the queens could have forced a retreat somewhere. This season, to be sure, is a very great exception, and the same condition may not happen again in fifty years.

• • •

There is an old adage that "one swallow does not make a summer." Neither does one rainstorm or one wet spell make a honey crop. Late in January our state was flooded, the hills were soaked—indeed, the ground was so thoroly soaked that landslides were frequent, even on the foothills where such things were rare. Beekeepers were jubilant, enthusiastic, and satisfied; but, alas! the rain ceased abruptly, the sun came forth in all its brilliancy, and the moisture began to go rapidly. Today, May 6, I read that ¼ inch of rain has just fallen in San Francisco, the first for 44 days, leaving the record for April the driest since 1857. There is a great lack of moisture all over the state, and honey-plants are the sufferers. My scale colony is making about two pounds net per day in the middle of the button-sage bloom, when I had every reason to believe that I might now be getting ten pounds at this period. Everything is all out of season from the very beginning. Orange bloom was over by the time it usually begins to bloom well. The sage followed in about the same unseasonable time, and other things in the same roll, with no moisture to help secrete nectar. So near and yet so far! so good and yet so poor!

XUM

NOTES FROM CANADA

J. L. Byer, Markham, Ont.

I have received a few pound packages of bees from the South by way of experiment. Shipment arrived in good order except one package that was starving. The bees had reached the "quiver" stage. Cages were soiled somewhat; and when the bees had their first flight, visible marks of their confinement were in evidence. Evidently, "dysentery" (?) can be caused without any cold weather, and by so short a confinement as five or six days. I had no trouble whatever in getting bees on to the combs in the hive; and after four days I found all queens laying nicely. While I could have given them brood to help them along, not a single comb did they get. They were supplied with combs and honey, and it will be a case of each one "paddling his own canoe." That is the only way to give a fair test to see what they will do in the way of building up and producing a possible surplus. As to the latter, while the bees are in good condition I would be willing to dispose of any possible surplus from them this season at a very moderate figure indeed.

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SUGAR $9.00 A HUNDRED.

The spring of 1916 will be remembered by many Ontario beekeepers as one of the most backward in years. To make matters worse, during the exceptionally warm January preceding, heavy brood-rearing was carried on by the bees, with the result that consumption of stores was abnormally heavy. With bees all in packing-cases, and with a knowledge that most of them are strong, but on the verge of starvation, continuously cool and wet weather right up to date, May 15, has a tendency to get one worrying a bit unless he is entirely proof against such folly. Wild-plum blossoms are not yet open as I write this, for May 15 is late, even for Ontario. Bees at our north yard had a late light flow of honey last fall from aster, etc., and as a result many old bees died off earlier, leaving colonies in good condition, but not so populous as here in York Co. The result is that the north bees are in fine order, and few are short of stores, while here in York Co., while bees are in fair shape as a rule, yet in my four yards I doubt if the bees have two pounds of old honey per colony. It is needless to say we are hoping that conditions will soon get better so that bees will get something from dandelion, fruit-bloom, etc., to tide them over till clover. Otherwise, buying sugar at near $9.00 a hundred is the alternative confronting us. But clover looks immense after all the rain we have had; and so, no doubt, all will try to tide their bees over, even if it does mean a heavy expense for the time being.

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MORE THAN ONE QUEEN IN A HIVE THRU THE WINTER.

From an experience we have just had, I am led to believe that possibly more than one queen is sometimes in a hive at the same time when the apiarist is not aware of the circumstance. In April, 1915, we found a clipped queen and another one unclipped, both on the same comb of brood. The young queen appeared to be fertilized, and I thought little of the occurrence, expecting that the old queen would soon disappear. Later on in May again, the two queens were still there, and, if I remember correctly, we saw them again in June. After that, being very busy, the colony was not examined again. They were prepared for winter with the other colonies; and as I noticed brood in the hive at the last examination I naturally presumed that the young queen was now alone on duty.

This spring I noticed this colony was not building up any too well; and, altho the day was not any too warm, I opened the hive, and—imagine my surprise to see the old clipped queen still on duty! Altho not very strong, yet some drones were being reared, and I concluded that the young queen, noticed over a year ago, and later as well, had not been fertilized and had been disposed of. I sent for a queen at once, and a few days ago my son and I went to hunt out the old clipped queen. As they are very gentle Italians she was soon found and disposed of. I was about to close the hive, when, on second thought, I decided to take another look for fear the young queen might still be there. On the very next comb, sure enough, there was the other queen, apparently a fine one in so far as looks go, and in the act of depositing an egg in a cell. No question as to any mistake in the matter whatever; and will some one please explain why these two queens were together a whole year? As the two together were not doing as good work as one queen should do, we broke up the dual monarchy by pinching the head of the young queen, even if she was all right in so far as appearances go.

BEEKEEPING AMONG THE ROCKIES

Wesley Foster, Boulder, Colorado

Almost everything in the arid regions needs special methods adapted to our special conditions. As an example, take the water treatment for foul brood. Some let the hives down very slowly into the water, or, rather, push them down, and, when clear down, put a heavy weight on top to hold them down. Here in the West we have a very easy method. We irrigate the foul brood. Go to the edge of the irrigating-ditch and dig a nice square hole, about six inches or so larger than your hives to be treated; then place your foul colony in the hole with the new hive on top, and a sufficient weight on top of that (sit on it if you want to). Dig a little ditch from your irrigating ditch to the hole, and let the water run in slowly and fill the hole. When you get one colony treated, take the old hive and comb out and dip out the water and treat another in the same way. One disadvantage of the water treatment is that the old hives and combs do not burn very readily; but suppose you have just one hive to treat—you can dig the hole a little deeper; and when you get the bees all out just cover the whole thing with two feet of earth.

Transferring box hives can be done by the water method; but the loss of brood will be considerable unless the box hive has cast a swarm one week previous to the treatment, in which case nothing of value need be lost by the treatment with water. as the honey is not hurt for bee-feed, and the wax is not injured. The hive, being only a box, is worth nothing anyway.

CONTROL OF BEE DISEASES BY RESTRICTING SHIPMENTS OF BEES AND QUEENS.

The development of beekeeping to its highest possibilities cannot be accomplished without the shipping of bees and queens from one point to another; neither can it be accomplished without certain restrictions. American foul brood cannot be transmitted, it is believed, by shipping bees and queens in combless and honeyless packages. European foul brood has been pretty certainly carried by sending queens thru the mails. American foul brood is easily transmitted in extracted and comb honey shipments. What are we to do in these contingencies?

Here in Colorado it has been recommended to the beekeepers that they refrain from purchasing bees and queens from outside the state. Inasmuch as we have European foul brood that may have been introduced by receiving queens from an infected district in another state it has been decided to caution beekeepers. And we are just as anxious and just as much concerned that no bees or queens shall be shipped out of this infected district. We believe we should take our own medicine, and are taking more of it than we ask any one else to take. Therefore beekeepers of Colorado are cautioned against buying bees and queens outside the state, and shipments of bees and queens are prohibited from the district infected with European foul brood in so far as our law will permit.

Shipments of infected honey are not allowed to go into general trade. They are directed to cracker-factories. However, beekeepers are too careless and indifferent in this regard, and we must mend our ways. An act prohibiting the shipment of comb or extracted honey from an infected apiary would meet with the writer's approval. At the present time it would be doubtful if it could be enforced; but we shall come to it sooner than many of us think. It would cause a *furore,* the like of which the hubbub over the net-weight law would be tame. In three years after such a restriction is passed the country would be freer of foul brood.

If the beekeepers would have notice served upon them that in two years all diseased apiaries would be prohibited from shipping honey until such apiaries are free from disease, it would make us hustle.

The editor of GLEANINGS recently spoke of too strict legislation in some states, and there is no doubt that some of the laws are more detrimental than helpful to beekeeping interests. I should like to see full and free discussion of the points over which there is dispute. The editor mentioned that if shipments of bees and queens were prohibited from one state to another the beekeepers would be handicapped in getting disease-resistant stock. But it is probably true that there is not a state but that contains beekeepers who have vigorous Italian stock that could be secured without going beyond the state lines for it.

Personally I do not believe that there is such a thing as stock becoming immune to the disease by long contact with it. There is no immunity without strong vigorous colonies headed by young prolific queens. And I have observed no advantages of the Italians over hybrids, strength and vigor considered.

A vigorous black colony so cross that no drifting bees are allowed to enter will furnish good immunity. [See Editorial.—ED.]

XUM

CONVERSATIONS WITH DOOLITTLE

At Borodino, New York.

AVOIDING BEING STUNG.

"Can you tell us how to avoid being stung? I do not mind an occasional sting, but my bees seem persistent in stinging me, so that some days I get from 20 to 50 or more stings."

Quite a little depends upon the individual in regard to this. If a man works at the bees with quick or jerky motions, when lifting hives, frames, or sections, he is apt to jar the bees more or less, and even kill many of them. A man having 20 colonies desired to come and work with me for a day or two to learn something more about the proper way of handling bees; so I told him to open a colony of my most peaceable bees just as he did his own, and if he lacked in any part I would show him a better way. The first thing he did was to throw (or, rather, drop) the shade-board on the ground in such a way that it fell over against the body of the hive with a heavy jar. I called a halt, telling him that in all the manipulations about a colony of bees everything must be done with a view to making as little disturbance as possible. He then commenced to pry the frames apart, and did it about as a man would pry up sticks of timber were they frozen down. I was about to call a halt again when he grabbed one of the loosened frames and brought it out with a trembling, jerking motion, causing the end-bars to strike the hive, and the one next to it, so that from 50 to 100 bees were crippled for life. In a short time he was getting out of the beeyard with more stings than I would get in two months.

A man must learn that much depends upon the flow of nectar and the weather. A cloudy or cool rainy day, when all the bees are kept at home, is the worst time to open hives unless it is a day when the bees have been robbing, or a cool day following a sudden stoppage of the nectar flow. If it is really necessary to handle bees at such times, the thoughtful apiarist will first make sure that his smoker is in good order, and is ready to give off a good volume of smoke. He will blow in a little of it at the entrance, and then pry up the cover a little very gently. As he does so he will send a stream of smoke into the crack made by the screw-driver or other tool he uses. This drives down the guards, and then the crack is made a little wider, and more smoke is driven in, when the cover is removed. If the bees appear nervous, and stick their heads up all along the spaces between the top-bars of the frames, standing high on their legs, and follow every motion with a turn of their heads, they should be given a few more light whiffs of smoke until they are subdued and show it by keeping mostly down below the top-bars among the combs. Using the hive-tool, the frames should be loosened very gently, the smoker being held in the other hand. If the bees stick their heads up at any time ready to show fight, they must be driven back again, and then the first frame very gently removed, care being taken that no bees are rolled over and bruised by the frame coming in contact with any part of the hive or other combs with force enough to cripple any of them. After the first frame is out, when working in this way the bees rarely show much fight; but if they do, a few whiffs should be given as they become restless.

In warm weather, with a nectar flow, I rarely blow smoke in at the entrance. Just a little in the crack when removing the cover, and a little smoke on its arrival, is all that is necessary with nine out of ten colonies, if care is used. I do not think that there is a colony in my yard that I could not go out and manipulate without either smoke or veil, and receive no stings, yet I would be obliged to work very slowly and carefully. It often happens that I wish to do just a little work with the bees—see if a queen has been released or if she has begun laying, or if the bees are working in the sections—and I neither light a smoker nor take a veil. I just work slowly and carefully. But the use of a smoker is a great saving of time. So is a veil, as one need not be quite so careful. I do not mean by this that I work roughly or mutilate the bees. I mean simply that I can do faster work.

A man accustomed to bees can go into an apiary where the bees are quite cross, and stay ten or fifteen minutes; and if the hands are free to use in protection, no stings will be received. At the same time a novice might be stung almost immediately, and a number of times, if he stayed that long. Pulling down the hat over the eyes, shading the face with the hands and arms, etc., help to disconcert the bees.

If a colony should get unduly stirred up so that a score or two of ugly bees follow about in an angry mood, I carry a wire-cloth "paddle" in my tool-box, and with this a few quick blows will kill the whole lot of them, so that peace is restored.

GENERAL CORRESPONDENCE

CONDITIONS UNDER WHICH WAX PRODUCTION ALONE IS POSSIBLE

BY LESLIE BURR

The beekeepers of the Hawaiian Islands produce but little beeswax. There seem to be two reasons for this. First, they have been contented in the past with producing honey; second, they have no bee diseases, and so have never had to do any wholesale cooking-up of combs, as beekeepers here had to do in many parts of the world. The only wax that is produced is from cappings.

In handling the cappings the Hawaiian beekeepers have adopted the usual method employed in California—that is, they use large solar extractors to melt the cappings, and then later cook the wax in large tanks or vats and run it off into cakes. These extractors are merely glass-covered boxes, bee-tight on top and honey-tight at the bottom. They are divided into two compartments by a screen. This screen is placed midway between the glass and the bottom of the tank, and it is on this screen that the cappings are placed. The honey in the cappings finds a ready passage thru the screen; and the wax, after having been melted by the sun, follows.

MAKING A SPECIALTY OF WAX PRODUCTION.

On the surface, conditions here in the Hawaiian Islands appear to be such that bees could be worked for wax as well as honey. These conditions that make for wax production are: A large portion of the honey produced is of very low quality, and an equally low price is obtained for it. Then there is the matter of transportation. The islands being located near the center of the Pacific Ocean, it is a long journey to any market. Ocean freight rates are by the ton, and the value of the freight makes but little difference in the rate charged. Then, too, wax is worth almost the same price here as on the Coast.

Just what procedure should be followed, or what can be done in the matter of wax production here, I do not now feel qualified to say. I have been here but six months, and during the time of year when the bees have least to do. It may be that the present method of working bees secures all the wax that can be obtained at a profit, yet I doubt it.

CONDITIONS IN THE HAWAIIAN ISLANDS.

Beekeeping everywhere is a matter that has to be worked according to local conditions. The time of year at which the surplus flows occur; the temperature, and the kind of weather; length and nature of flows, and many other matters all have a bearing. While it is safe to say that, as a rule, bees will do like things under like circumstances and conditions, yet there are very few localities where identical circumstances and conditions exist. For example, take Cuba and the Island of Oahu. Both islands are north of the equator, and located at just about the same distance from it, yet the honey seasons are reversed. In Cuba the honey season is during the winter months, while on Oahu the flow is during summer. The temperature of the two islands, I think, is almost identical, month for month, yet the general weather conditions differ greatly. In Cuba the rains come in the summer, while on Oahu the rains are generally during the winter months. So, because a thing can be done in Cuba it does not necessarily follow that it can be done in the Hawaiian Islands, and *vice versa*.

One thing that was a surprise to me here was that, among those interested in bees, at least among those I have met, I have as yet to find the first person who seems to have any interest in increasing the output of beeswax. In fact, none claims to have given the subject a thought.

In Cuba, years ago, wax production was one of the common topics of conversation among honey-producers—at least it was a common topic every time the price of honey went down. Some of the honey-producers used to advocate the working of bees for wax alone, their idea being to locate an apiary in some of the out-of-the-way places, where the territory was exceedingly good (or at least supposed to be of that nature), such as some of the locations up in the mountains, or down in the mangrove swamps on the Caribbean coast. The usual plan of management advocated was to use native hives—that is, hollow logs, and then work the bees native fashion by cutting out the surplus honey first from one end of the log and then from the other end. The natives place the log hives in rocks in a horizontal position. The honey, after taking out the wax, was to be fed back to the bees, over and over again, until nothing but wax was left. However, so far as I am aware none of those who advocated such methods of beekeeping ever tried to put their plans

into operation. Such discussions were generally looked upon in the light of pastime. Perhaps some of those who used to discuss wax production to the exclusion of honey may have been serious enough to hope that some person would try the scheme and thereby satisfy curiosity.

The bee is primarily a honey-producing insect, and I don't think that man will ever be able to alter its nature enough to change it into an insect whose principal object in life will be to produce beeswax.

While working bees for wax alone—that is, to the exclusion of honey, may be but a dream; yet working bees in such a manner as to increase the amount of wax obtained, and the profit from the apiary thereby, is, in my opinion, possible in most localities—at least that is my belief. The basis of this belief is that during a flow of honey the bees will produce a certain amount of wax without any appreciable decrease in the amount of honey that is gathered, and that the average beekeeper does not secure all of this wax.

As to methods of securing this wax, the most simple is by proper spacing of the frames in the super, and by the proper uncapping of the combs. By proper spacing I mean wide spacing; that is, eight frames to a ten-frame super. I have visited apiaries of many extensive beekeepers and found the frames in the supers spaced the same as in the brood-nest, and have heard some of these same beekeepers boast as to how thin they could slice off the cappings. They were working their bees so as to get as little wax as possible, and prided themselves on that fact.

In the matter of spacing, my experience has been that just as much honey can be obtained when the combs are spaced wide, and, when uncapping, slice the comb down even with the wood of the frame. This also makes it easier to take out the full frames of honey from the supers; and it is also easier, when uncapping, to slice off a good thick slice of comb than merely to remove the bare cappings.

In this matter of wide spacing, conditions also play a part. With strong colonies the combs can be spaced wider than in weak ones; and during a heavy flow of honey wider spacing can be practiced than when the flow is light. This wide spacing, I also think, holds down swarming in a measure.

In tropical or semi-tropical climates where there are long spells during which time the bees gather merely enough honey on which to live, considerable comb can be obtained by having it built in the brood-nest. Under such conditions combs so built are clear gain; for if the bees are left to their own devices, nothing is obtained from them.

In the matter of working bees for wax alone, there are certain conditions under which it can be done. I know this to be a fact, because I have done it. I think I have told of the manner in which it was done, in previous articles to GLEANINGS. But as that was some years ago, and I suppose most of the readers have forgotten what I then said, or that I ever wrote anything on the subject, I will risk telling the tale again.

HOW BEES WERE WORKED FOR WAX ALONE.

In Cuba, that is, in most parts of it, the principal honey-flow is during the winter months, the heaviest flow being during December and January. In summer the bees are practically idle; but in early spring and early fall there is a light flow of honey, during which the bees breed like mad, and swarm accordingly. As a rule the honey gathered during these spring and fall flows is of very poor quality, and of little value, even if it were possible to secure it, which is not the case, for the bees have no desire to store this honey in the supers, their sole idea being to turn it into brood. It was during this spring flow that the bees were worked for wax. The process was simple. Care was taken that none of the combs in the brood-nest contained any drone comb; then the queen was confined below with a queen-excluder. In the super the combs were interspaced with empty frames, care being taken to see that those combs in the super contained no drone comb. Under those conditions the bees were possessed with the idea of building drone comb. As the queen was below she could not lay in this new drone comb when built; and as the bees desired drone brood the comb was held open for the queen to lay in, no honey being stored in it. After the hives had once been prepared in the manner indicated, the production of wax was a simple matter. All that had to be done was to make the rounds of the supers twice a week and cut out this newly built drone comb. When the early flow came on in the fall, all combs needed for the winter flow were drawn out.

By the foregoing procedure considerable wax was obtained when, under ordinary practice, nothing could have been obtained from the bees but increase; and as increase was not desired, the wax obtained was just so much clear profit.

In conclusion I wish to say that I think I have made it clear that I do not believe that bees can be worked for wax alone—that is, to the exclusion of honey, under any

other conditions than those described as existing in Cuba.

As to producing wax by having comb built in the brood-nest: I was able to do that two seasons out of three in San Diego, California—that is, in the city of San Diego. The same conditions did not exist outside of the city.

In the northern states I doubt whether conditions will allow of the increased production of wax by any other means than wide spacing—at least I believe such to be the fact in most locations and under normal conditions.

Honolulu, H. I.

THE PRODUCTION OF WAX IN CUBA

BY FRANK REIMAN

The production of wax in Cuba is of almost equal importance to that of honey, as the statistics of exportation show. By the old system of keeping bees in hollow logs, one pound of wax was produced for every gallon of honey, which was from two to five gallons according to the year. By my system I secure about five pounds of wax and ten gallons of honey a year. The past year was the greatest failure I ever had. My honey crop was only 75 barrels and 2000 pounds of wax. The spring crop was very poor, because no rain fell until the last of April. In July the rains, which were scant, stopped entirely, and we are now over seven months with less than half an inch of rainfall all told. This is the dryest spell I ever saw in any country. The cold was also so excessive that neither honey nor wax was produced. From the middle of October until Feb. 1 the thermometer stood at about 50 degrees each morning, rising to about 60 or 65 by noon. Some mornings it was as low as 40, with cold winds and clouds all day.

I am confident that the people of the United States believe that it is very warm in Cuba all the year round. This is a mistake. I have seen the thermometer at 34 in the morning, without rising above 40 all day. I have also seen the winters so warm that the bees swarmed February 10.

I use a long ten-frame hive which has frames 20½ inches long by 6 deep. I use neither foundation nor wire—ten frames below and nine in the super. My new combs I raise exclusively in the super, for in the super the bees work to the bottom-bars. In the bottom of the hive they leave half an inch of space between the comb and the bottom-bar. I use five empty combs with four frames alternately in the super. In a week they will fill the four empty frames. If they are drone comb they are worth five cents each for wax. If they are worker comb they are worth at least ten cents each to use for brood. When not enough honey comes in to extract I look at all the hives each week, make new swarms with the good combs, and cut out all the drone comb except in special hives for breeding, and all old comb without honey.

In extracting, a woman cuts all the drone comb and old combs, which usually makes from 25 to 50 pounds with the cappings in extracting one beeyard.

I have never tried feeding back honey to make wax; but I am sure it will not pay here, as enough honey usually comes in all the year—enough for the bees to make some wax. I have fed back to finish sections of comb honey, and find that the bees made only about one section a day, whereas they naturally would make at least five with honey coming in from the fields; and, besides, the honey was darker. In the spring and summer months the wax must be made up every day, if possible, or it will ferment and spoil on account of the drone brood. The moths will also eat the combs all the year round. Dogs will also eat the combs if the combs contain honey or brood. To learn this cost me several dollars. I left a box of comb out over night, and in the morning it was cleaned up. The neighbors told me the dogs did it.

My mode of rendering wax is simpler and less expensive than any other method I know of. The outfit consists of six empty five-gallon gasoline-cans, a peanut-sack, a barrel cut in two, and a pair of stout sticks securely tied together with a stout cord. I place the cans three in a row. Over them I run bars about six inches from the ground so I can heat six cans with one fire. I fill the cans one-third full of water; and when the water boils I keep putting in combs until the can is two-thirds full. When the combs are melted, and begin to foam, I pour the contents of the can into the sack which is suspended over the half-barrel. I begin pressing the sack between the two sticks, working the two sticks up and down until no more wax comes out. I then throw the refuse away. When there are two persons you can use eight cans and make from 200 to 500 pounds of wax a day according to the quality of the combs.

XUM

When there is much wax to make, it is advisable that there be two to work at rendering, as they can work to better advantage, and press the wax cleaner. The second person twists the bag while the first holds it between the two sticks. Combs or cappings with honey should be first melted with a little water to get the honey out over a slow fire, and should not be heated until the wax boils, as it will spoil the honey, and the wax will be harder to render afterward. When the wax is rendered with a quantity of honey in it, it comes out in a mess of granules like shot when cold, and must be melted again.

The cans cost here 15 cents each, and last about three months. A bag lasts long enough to make from 500 to 1000 pounds if it does not get bad treatment by pressing hard enough to tear it. The wax, when melting, should be constantly stirred from the bottom upward, and not pressed down from the top, else it will burn the cans, and the wax will have a burnt flavor. When wooden utensils are used to hold the melted wax they should be soaked with water first so the wax will not stick to the sides. When tin cans are used they should be about two-thirds full, and inclined at an angle after the wax is in the can so it will come out easily when cold. This trick I learned about ten years ago when I had a can that leaked on one side when I inclined it to stop leaking. In the morning the can let the wax out easily, while I had to work at the others to get the wax out. For the last ten years I have always had about 1500 hives of bees in eight to ten yards. My average crop of wax is about 5000 lbs. a year.

At present the price is 40 cts. per gallon for honey and 24 cts. a pound for wax. Russia is our chief buyer of wax, which market is at present shut off by the war. The honey moves as usual, being shipped to Germany via Holland.

Cauto el Paso, Cuba.

[Different parties who make a business of buying up slumgum and rendering it into wax report that the refuse left when combs are rendered by the hinged-board method yield from five to fifteen per cent of its own weight in wax. In our opinion, for a wax crop of 5000 pounds a year a large-sized powerful press should be used in a can or tank to permit the combs to be under boiling water during the pressing. We do not believe there is any other practical way of getting all the wax. See report by F. A. Hooper, page 458.—ED.]

GIVING WAX THE MAIN TRACK WHERE THE COST OF GETTING HONEY TO MARKET IS PROHIBITORY

BY W. G. HEWES

In this locality the price to the producer for extracted honey during the past two years has been 3½ cents a pound. Beeswax has brought from 27 to 32 cents or from eight to nine times as much as honey. It seems to me that, under these conditions, it would be wise for the 3½-cent honey-producer to run his bees for wax and let honey be the incidental instead of wax, as is now the case.

Between my bees and a depot are fifteen miles of awful road. Twelve cases of honey weighing 1600 pounds is a load for two horses. Such a load, when delivered in Yuma, is worth $50.40. A load of wax of the same weight is worth $432. In other words, it costs more than 8½ times as much to get a dollar's worth of honey to town as it does to get a dollar's worth of wax. The wax is shipped in sacks, which, so far as I am concerned, cost nothing. It takes 20 per cent of what my honey sells for to pay for the cans and cases. Were that old chestnut true, about its taking twenty pounds of honey to make one pound of wax it would not pay to make a specialty of wax production, even if it is worth eight times as much as honey. But that is fol-de-rol. During a honey-flow I don't believe a hive having plenty of young bees will consume five pounds of honey to make a pound of wax. But here is another point: If the producers of three-cent honey would so generally turn from honey production to wax production as to make a material reduction in the honey crop, the short supply would cause an advance in price, and probably sell for as much as would a large crop.

Four years ago cotton was selling for 16 cts. a pound, buyers believing the output would be 12,000,000 bales. When the Government came out with its report, saying the output would be 15,000,000 bales, the price dropped so that the large crop sold for several hundred million dollars less than the small one would have done. The cotton-growers would have been better off had they fished more and worked less. Put this old world on half rations, and it treats you well. You can sport around in automo-

biles; but give it a full ration, and your only show for an automobile ride is when the police run you in as a vagrant.

To raise more wax and less honey, begin in the spring by cutting out and melting up everything but perfect brood-combs. Then replace the empty frames; and when they are filled with new comb and honey cut out the combs, drop them into some receptacle like a McIntyre uncapping-box, from which, after being crushed and chopped up with a short spade, most of the honey can drain off into a tank. A capping-melter will get the rest and the wax. I have queen-excluders for all my hives, and would consider them an essential in wax production, so as not to be bothered by brood, for queens dearly love to lay eggs in new comb.

I shall try this season to see how much wax I can get from my 250 hives; and if the beekeepers of the West Indies and our southern states—Arizona, Imperial Valley, and northern California, would do likewise, I feel sure it would be advantageous to us all.

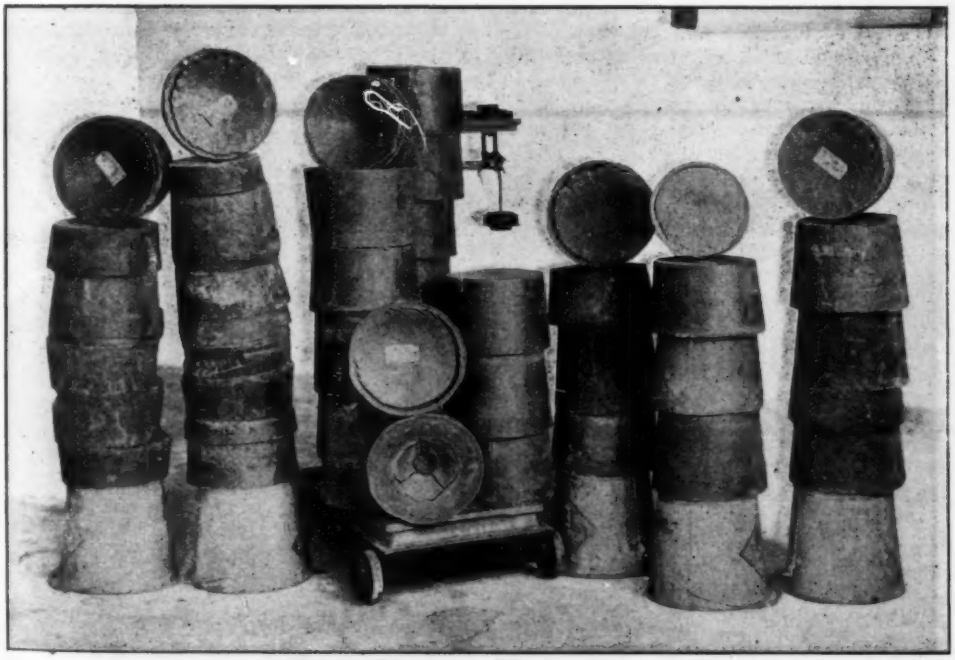
Yuma, Ariz.

[We hope that our correspondent, after he runs his bees for all they are worth for wax, will make a further report.—ED.]

USE SOFT WATER TO FACILITATE WAX-RENDERING

BY W. B. BRAY

In the method I use in rendering the wax from old combs I am able, in the one operation, to get the wax into large clean blocks ready for market. I melt the combs in a large copper boiler and press them in a Hatch press, which I consider is the most useful press for any beekeeper. I cut out an extra melting operation by catching the wax and water from the press in a benzine-tin *which has a small tap soldered in at the bottom*. When this tin is full I keep on drawing the water off at the tap, and return it to the boiler. By using the same water all the time, I save firing, do quicker work, and the wax remains hot in the tin. When it is nearly full I strain the wax and some water into a clean tin, which is then well covered up so that the wax will cool very slowly. A couple of days after, I can take the block of wax out and scrape all the dirt off the bottom. Even this dirt contains a small quantity of wax, so I put it in the



Wax rendered by members of the apicultural class at the Massachusetts Agricultural College. Different processes are demonstrated by the students under the direction of Dr. Burton N. Gates.

solar extractor, which makes a thoro job of removing it.

A most important point in all wax-melting operations is to use soft water. I am sure that hard water accounts for the loss of tons of wax in a year.

Speaking of tons reminds me that our ton is 2240 lbs. We call the American ton, 2000 lbs., "short ton." Your five-gallon can holds 60 lbs. of honey, so the gallon of honey must weigh 12 lbs. Our gallon holds 14¼ lbs. of honey—a matter of "locality" again.

Wainiu, New Zealand.

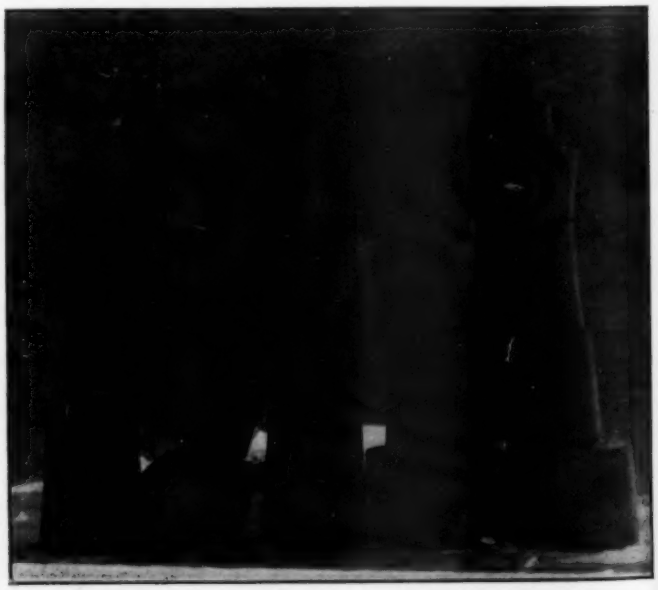
RENDERING CAPPINGS INTO MARKETABLE WAX

BY J. L. BYER.

Some years ago while buying honey in Ontario a beekeeper, after showing me his crop of 4000 pounds of honey, and stating the price he wanted for it, incidentally remarked that, "in taking off that lot of honey, not a handful of cappings were removed." That was a "record" all right, and I promptly told him so, adding at the same time some remarks that I fear were hardly complimentary to such a method of harvesting a crop of clover honey. The honey was very white, but, needless to say, light in body, and lacked that characteristic flavor that is obtained here in Ontario, at least, only by allowing the bees to cure the honey on the hive—a process that calls for the most of the honey to be sealed over before being extracted.

The man referred to represents the extreme view on the part of a very few, fortunately, who produce extracted honey. While he had not a handful of wax from 4000 pounds of honey, it is natural to ask how much wax can be secured from a given amount of honey. Of course the answer all depends upon certain factors, such as to whether we cut deep or shallow when uncapping, and also to the proportion of the combs capped over when the honey is extracted. Last year we had a good crop of honey at our north yard; and as we were busy during the honey-flow, and also had a full complement of extracting-supers at that yard, all honey was left on the hives till the close of the white-honey flow. There was no buckwheat to make us hasten operations. In York Co. the crop was very light — about 25 pounds to the colony, of white honey, and we had a second flow from buckwheat of about the same amount. Of course at the north yard we had a much larger amount of cappings than here at home, as up there the supers were filled, while down here in York Co. very few supers were filled, and the majority of the combs had quite a lot of unsealed honey in when extracting was done. About two-thirds of our crop of 36,000 pounds of honey was produced at the north yard; and as the cappings were all melted together here at home, I cannot give the exact proportion from any one yard as compared with another. However, the general average is about the same as for other years; and after weighing up the wax from the cappings I find that we get about one pound of wax to every 100 pounds of honey extracted.

The picture shows the wax just as it came from the press, and that pile represents 365 pounds of very nice wax, altho the cakes were cooled too rapidly, as can



365 lbs. of wax obtained from cappings from 36,000 lbs. of honey.

be seen by the cheeks in some of them. On this basis we must have had much more than one pound of wax to every hundred of honey at the north yard, as at a rough guess I should say that not more than half of the honey here at home was sealed over, while at the north yard nearly all combs were about solid. Unfortunately we have never had a full crop in both counties at the same time; and as cappings are always rendered up in winter, and all put together, results have always been about the same. At any rate it looks as tho one should expect a pound of wax to 100 of honey, provided the crop is average in quantity. How does this accord with the experience of other extracted-honey producers?

We are often asked how we dispose of the cappings. After trying a capping-melter a few years ago with indifferent results at best, we are again back to the old-style methods we have used for some time. I am told that the new-style melters are all right in that they do not color or "cook" the honey; but I have not tried them, so cannot speak from experience. One thing objectionable with all of them is that it means extra heat in the building at a time of the year when we need nothing extra along that line. We use the old-style divisible capping-cans, and like to have two at each yard. One will about handle the cappings for a single day's work, and with two cans the cappings can be left to drain much longer than when only one is used. The only objection that we have found is that they are too deep to allow as much drainage as a longer and shallower uncapping-device. On the other hand, they are bee-tight, can be easily taken from one place to another if necessary, and they also take up little room. In crowded buildings this latter point is a strong one in their favor. After draining the cappings as long as we can leave them in the cans, they are dumped into empty barrels till we have time later in the fall to attend to them.

Formerly we put the cappings all thru the capping-melter in the winter, removing all the honey, and then the wax and all refuse with it was melted up and run thru the press, and then into the flaring tins we use for the purpose. But that was too slow a job, so we now put a pail of water in a large kettle outdoors, and then fill up with the cappings. The mass is heated till all is thoroly dissolved, but not boiling, and then removed from the fire and allowed to cool. Of course the honey with the small amount of water will all be at the bottom, and wax can be lifted off the top. When all the cappings are treated like this, then the wax in the rough, as it will be, is broken up and remelted in a warm room. We have a stove in our furnace-room and do the work there. The honey and water taken from the cappings is, of course, unfit for market, but it will not sour or granulate, and in the spring it makes first-class food for the bees if any feeding is necessary. Before feeding we add some more water and then bring all to a sharp boil to avoid any chance of disease.

This method of handling the cappings is, no doubt, out of date in some ways; but until we decide to use a melter while extracting, and thus dispose of the cappings at once, I expect to continue as at present, as it is about the quickest way we have found of solving the problem.

Markham, Ont.

RENDERING FOUL-BROOD COMBS INTO WAX

BY EARL F. TOWNSEND

In talking with a beekeeper regarding the control of American foul brood he informed me that, after shaking the bees, he burned the remaining brood-frames and combs. This seemed to me rather wasteful, as I have recently sold a quantity of prime wax rendered from foul-brood combs to a large manufacturing concern at 45 cts. per lb. Had I followed his method these combs would have been an entire loss. It occurred to me that some of the newer beekeepers might be interested in our method of rendering such combs.

We do not shake for American foul brood at all, never having had very flattering success with the plan (altho possibly this may have been my fault); but when we come across an affected colony during our regular inspection we make a note of it; and as we usually find them before they are very weak, we contract the entrance and run them for all they are worth during the honey-flow, allowing what bees remain in the fall to starve. During the winter we render the combs.

After putting the wax thru a Hatch press, we again melt the refuse with a small amount of water, and put it thru the press again, this time placing inside the burlap cloth a piece of coarse unbleached cotton cloth which catches any small particles of dirt which may have come thru the burlap at the first pressing. We pour the wax into a metal dish having flaring sides, larger at

the top than bottom, and allow it to stand until the wax is solid, when contraction will allow it to slip out smoothly in beautiful cakes.

When cutting combs out of the frames we place frames back in the hive-bodies until wax-rendering is finished, when we have a "boiling up" as follows:

In an ordinary wash-boiler about half full of water we place half a can of lye, and in this boil as many frames as can be placed upright therein. As this amount of water will not entirely cover the frames, after boiling a few minutes we reverse them and boil, possibly five minutes. This boiling cleans the frames nicely, leaving them almost as nice as new ones. We then scorch the hive bodies inside, and wash the outsides with a strong solution of some disinfectant, usually the cheap coal-tar products, such as krese or hygens A. Since carbolic acid, due to the European war, has become a luxury, we also scorch the bottom-boards. We then rewire the frames, and fasten full sheets of brood-foundation.

This "occasional cleaning up" is an advantage, as it gives us some very nice new combs at the end of the following season, in place of a lot of old ones; many of them filled half or more with old pollen—too old, probably, for the bees to make much use of. We try to be very careful not to carry any foul-brood germs out of the room where the rendering is done, by stepping on particles of comb which may become scattered when cutting combs from frames. Before leaving the room we wash the bottoms of our shoes with the disinfectant mentioned.

EXTRACTING THE HONEY FROM CAPPINGS BY CENTRIFUGAL FORCE

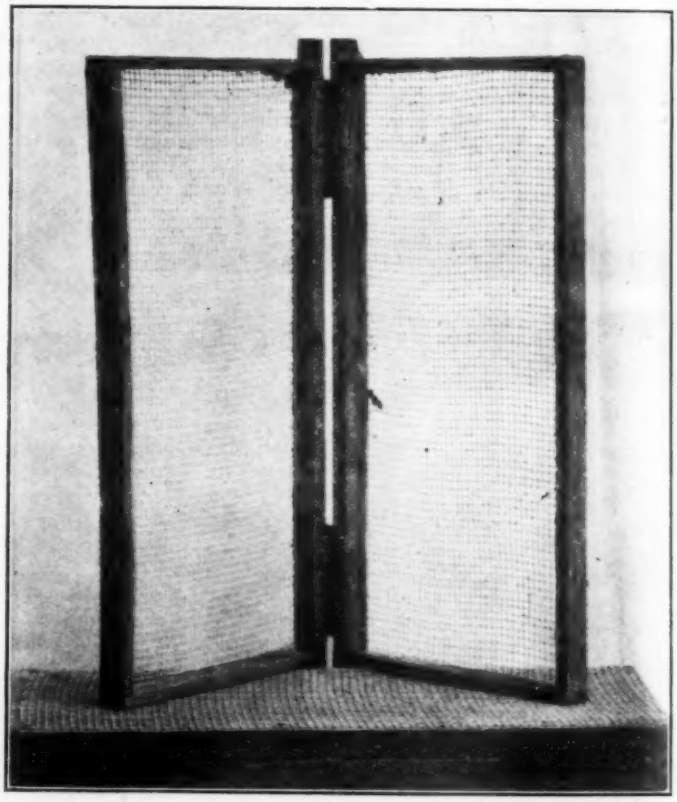
BY C. E. FOWLER

I have been using folding pockets for extracting the honey from cappings, small pieces of comb, or even sections that are not salable.

The pocket is made of two frames of 1½x⅞ strips, hinged with leather. By making the lumber thinner the pockets could be made to hold eight sections 4¼x4¼, or a gallon of cappings.

Large beekeepers may not want to bother by extracting cappings; but for the small beekeeper it saves a lot of fussing, and finishes the job all at once, even to rendering the wax; and the room can be all cleaned up the same day. The mesh of the netting is 4½ to the inch, but finer would probably be just as good, or better.

Hammonton, N. J.



Folding pocket for extracting cappings in an ordinary honey-extractor.

A RACE BETWEEN HONEY AND WAX

BY A. J. WRIGHT

Possibly some of my experiments may be of interest along the line of wax production in the season of 1912, the best season with me for the production of honey in this locality for several years. I selected two strong colonies, one intended for wax production only, and the other for honey. Both colonies were very strong. I may say that the colony selected for wax in previous seasons had shown a marked proclivity for depositing wax in every available place inside the hive, and giving a comparatively small surplus of honey. The colony selected for honey production showed opposite traits in a marked degree, everything being clean and neat, and the honey going where it should. Having decided to let the wax colony have its own head, I also decided to put it in financial competition with the honey colony referred to.

About June 1, when white clover began to appear, I put on the wax colony an eight-frame hive-body, the same as the lower hive, without a queen-excluder: The upper hive contained eleven boards, the same dimensions as the regular frames, but only half an inch thick. The hive was leveled, and the half-inch boards had a wire nail driven in each opposite end, near the top to rest on the tin rabbets. No spacers were used, the boards being spaced by guess ½ inch apart. A ¾-inch strip was tacked on the top of the upper hive to give wax space under the cover. A similar hive-body was prepared and set aside to be used later on. A single frame of brood in various stages of development was taken from below and placed above (removing two of the boards for the purpose). I was careful to leave the queen below. This brood was for the sole purpose of inducing the bees to go above. Altho no excluder was used, yet the queen was never found above thru any of the manipulation that followed. The cappings of all honey below for two inches or more below the top-bar were broken by passing a knife flatwise over them but not enough to make the cells leak. Before the wax-boards were placed in the upper story each board was painted with a thin coating of hot wax, both sides. The following outfit I found necessary: A knife with blade long enough to reach to bottom of the hive, and turned up at the end like a miniature hoe, and a scraper. The knife was used to scrape the wax from the wall of the hive by an upward motion, and the scraper to remove the wax from the top of the frames in the lower hive, from the under side of the cover, and from the wax-boards in the upper story. I used a wooden device to remove the wax from between the frames below. The small end, which was 1¼ inches long, was inserted between the top-bars, and a downward motion on the handle raised the wax to the top of the frames. In addition to the above there should be a pan long enough to allow one of the wax-bearers to stand on end, and of sufficient width and depth to hold the comb or wax scraped off.

Everything being ready, developments were watched with interest. The honey-flow was now on in earnest, and in three days' time the cover was removed, and wax in a limited amount was found in patches between the cover and top of wax-boards. One of the wax-boards was removed, and spurs of wax or comb were built out from the sides of the board and the adjoining one, and also from the sides of the hive, but I decided not to remove any at this time. Four days later I decided to remove what there might be anyway. I undertook to remove the cover; but in doing so I snapped off the blade of a new knife. I then inserted a hive-tool, and, removing the cover, I found parallel ridges of wax following the tops of the wax-boards and the top of the frame. I then removed the upper story entire, and put the one prepared as mentioned above in its place, first removing with the wooden device all wax from between the top-bars of the lower hive, and with the scraper all wax on top of said top-bars. I then removed each wax-board and shook the bees on to the wax-boards in the upper story; then the end of each wax-board was placed in the pan, and with a downward motion of the scraper the wax was removed from each side of the wax-board, and so for each one, but leaving a coating of wax on each board as a foundation for future work. The frame of brood was now returned to the lower hive after carefully assuring myself that no queen-cells had been started. I weighed the comb gathered, and found I had 12 ounces before rendering. The following week I took 18 ounces, and after that I removed the wax every four days during the honey-flow. The largest yield in eight days was 1¾ pounds. The total amount of wax received from this colony after rendering was 16 pounds. This, at 32 cts., made the gross receipts $5.12. The colony set aside for comb honey gave a surplus of 152 lbs., at 15 cts. per pound for

60 pounds white, $9.00; 12 cts. per pound for 92 lbs. dark, $11.04, making the gross receipts from this source $20.04.

My conclusion is that wax in this locality as a main crop is not practical. In some sections, no doubt, it might pay where the seasons are long, and an inferior or cheap grade only of honey can be produced.

For wax production the following I regard as absolutely necessary: A very strong colony, and one especially given to wax production; an extra good honey-flow, and a warm super, so that wax can be worked by the bees at all times.

Bradford, N. Y.

AS GLIMPSED THRU THE CAMERA

Some Common and Uncommon Sights among the Bees

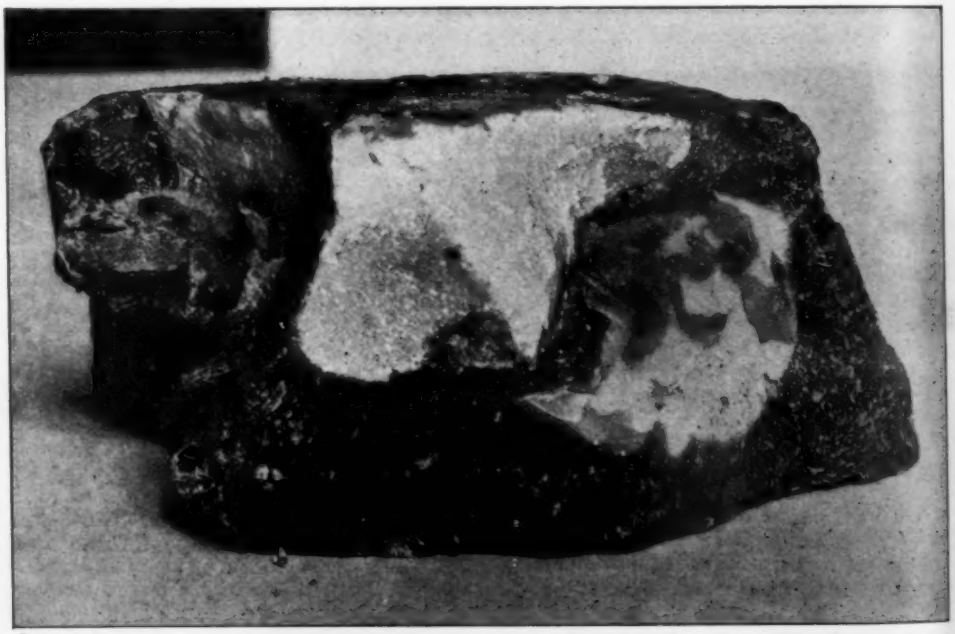
BY H. H. ROOT

In factories where comb foundation is made and wax is bought in large quantities it is necessary to break open every piece of wax in order to tell its color so that it may be graded. Two grades are usually made—one for brood foundation and the other for super. In this process some very amusing cases of adulteration are occasionally found. If I were going to adopt dishonest practices in order to gain a livelihood, beeswax is about the last thing that I would try to adulterate, for such adulterations are so easy to detect.

Here are two instances of adulteration that are almost laughable. The first illustration shows a cake of wax, the inside of which is tallow. The party who fixed this up evidently placed a few pieces of tallow in the dish and then poured in the melted beeswax. The first crack with the hammer revealed the tallow, which, as the photograph shows, can be seen very plainly. And if the tallow had been melted and thoroly mixed with the wax it would have been even easier to discover, for a very little tallow mixed with wax makes a "sticky" combination, entirely different from pure beeswax.

The second illustration shows a couple of zinc fruit-jar lids surrounded by beeswax. If the price of zinc continues to go up I wonder if the time will not soon come when this particular man would find it more profitable to pour wax into the lids and sell them as scrap zinc!

For a good many years I have read all

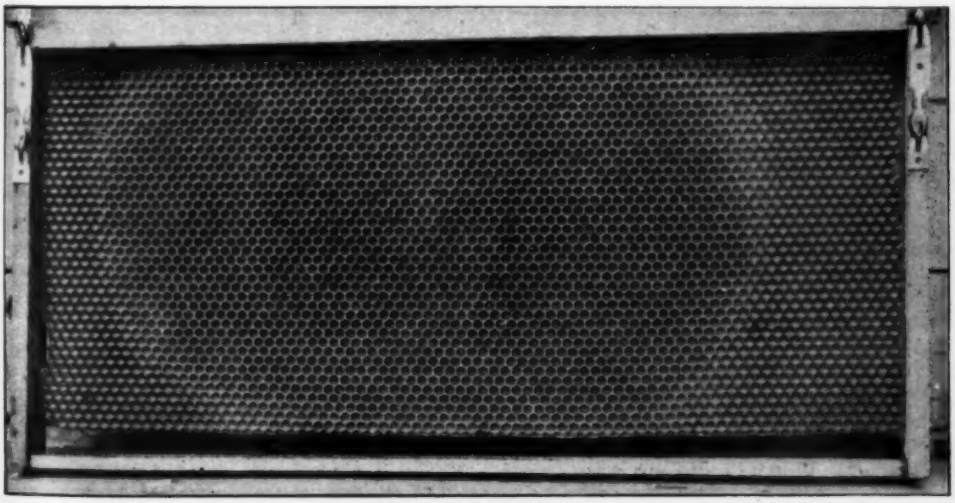


A cake of wax adulterated with tallow. If the tallow is melted and mixed with the wax it makes it feel sticky. In this instance hot wax was poured over pieces of tallow, which showed very plainly when the cake was broken up.

the discussions in GLEANINGS on the subject of the amount of honey or syrup required to enable bees to secrete a given amount of wax, and I confess to a growing feeling of "you'll have to show me" in regard to the statement that it takes fifteen (or even seven pounds) of honey to produce one pound of wax. The amount of comb that bees sometimes build when confined in a cage tends to disprove these theories. No doubt, under certain circumstances, if fifteen pounds of honey were fed to a colony, not more than a pound of wax would be secreted; but what of the amount that the bees feed to brood, and actually consume for their own sustenance?

Zinc fruit-jar lids make a novel form of adulterant for beeswax.

How a sheet of foundation does "grow" when the bees get at it! In case of foundation they draw out the cells about 3/8 inch, on the average, before being obliged to add new wax. But when a strong force of bees clusters on a sheet of foundation during a warm day when honey is coming in just right, and they need the room, they will go far toward changing the foundation into comb in ten hours' time.



Full sheet of comb foundation partly "drawn out" into comb.

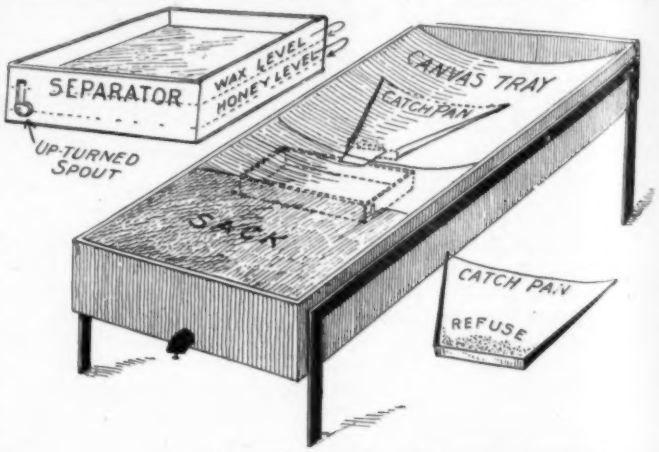
PROFITABLE PRODUCTION OF BEESWAX

Running Combs, Honey, and all thru the Solar Extractor

BY JOSEPH GRAY

The editor has struck a line of thought that interests me greatly since honey is going down in price and wax rising. Furthermore, the cost of cans and cases is going up. For 500 lbs. of beeswax we need only a few sacks for shipment, and a one-horse rig will haul it. At 30 cents per lb. it represents a value of $150.

I was well satisfied with last year's wax production, which I considered as important as the honey production. In certain parts of the season, ready-built comb is a big advantage; yet there are times when bees want and will build comb. When honey comes rolling in I space eight combs in a ten-frame super. This makes the combs weigh 8 to 10 lbs. each; and when uncapped they yield an abundance of wax. To uncap I use a butcher's saw, and use it in the same manner as a butcher uses it — with a downward cut and a sawing motion. The thin narrow blade cuts the cappings readily. I have a wet sack in my uncapping-box, and when full of cappings it is lifted out so that there is no handling of mussy cappings. An extra tub is handy to carry the sack of cappings.



The illustration shows my solar extractor which was originally a milk-cooler—the best solar I ever used. It is 6 feet long, 3 wide, and 1 deep, with a 1½-inch faucet. The cappings are carried and dumped on to a loose canvas tray, the tray supported by wire cloth, and having an extra canvas fastened down with the wire cloth. A catch tin is slipped under the lower end of the canvas tray, which holds back the refuse. This is made out of the end of a five-gallon can. The honey and wax run into a five-gallon oil-can that has a turned spout. The honey, when it reaches the level of the spout, runs out into the lower end of the solar, and is drawn off by the faucet. The sack shown in Fig. 1 protects the honey from the direct rays of the sun. The wax furnishes all the protection needed in the wax-mold. The mold is in the sun all day, so that the wax keeps liquid and makes a uniform cake which cools during the night. In the morning the wax is taken out and left to finish cooling, and a fresh mold put in. It facilitates the work to have an extra catch pan and canvas as well as an extra mold.

There is no better material for a mold than the thin tin of a five-gallon can. The sides will spring out and release the cake of wax. The cake of wax is washed, and, if necessary to free it of honey, scraped on the under side, leaving it in good condition for market.

So satisfied am I with wax production on account of its low cost in labor, etc., that I have been seriously thinking of extending its production by cutting out the combs one inch from the top-bar and increasing the number of solars. I would melt everything in the solars, discard the uncapping and extracting, and I would put back the frames with one-inch strips of comb and allow the bees to rebuild the same above an excluder. My reasons for doing this are threefold:

1. Less work; the manipulation of combs in the solar, instead of uncapping and extracting, would cut the labor bill in two.

2. We have sufficient sun heat to make it a success here in Imperial Valley—no cost for artificial heat.

3. By the method used in my arrangement of the solar, the honey, as soon as it is melted, is under cover, and never burned. In fact, it is improved rather than impaired by passing thru the solar. I figured that, when I had once a full set of combs, the work would be clean—no refuse—and I would have a fine grade of honey and

wax. Excluders would have to be used, and it would be best only to half empty a super at one taking, alternating the combs.

To feed back honey in Miller feeders, and produce wax only, would not be necessary for me, as I am close to railway facilities; but if I were located where nothing could reach me but pack mules, then I certainly would produce wax only.

Honey nets us 4 cents per lb., and wax 26 cents. It takes the bees an average of six pounds of honey to produce one of wax —a gain of 2 cents. Combine this with the low cost of production less risk of thief, cheaper hauling, warehousing, freight, it ought to pay at present prices.

Heber, Cal.

COLLECTION AND EXPORTATION OF THE WAX OF WILD BEES IN AFRICAN COLONIES

BY A. S. ASHTON

Michel E. (Agricultural Engineer at the Ministry of the Colonies), in *Bulletin Agricole du Congo Belge*, Vol. V., No. 2, pp. 385-395, Brussels, June, 1914.

This paper contains information on the wild-bee honey in the African colonies, a description of the native methods of beekeeping in the Belgian Congo, in the Soudan, and in Tunis, and of the improved methods of separating wax (melting by solar heat, in a stove, in boiling water).

The trade in wild beeswax is constantly increasing in most of the African colonies, especially in Gambia, Gold Coast, Nigeria, Soudan, Uganda, British East Africa, German East Africa, Mozambique. A few years ago the exportation of wax from these countries was insignificant, while now it amounts to many tons. Wax occupies the third place in the export trade of Angola (Benguela supplying 90 per cent of the exports of the whole province). Angola exports every year 600 to 700 tons of wax; Mozambique about 100; Portuguese Guinea, 50. The wax is exported in cakes weighing 253 to 264 lbs. each. The quantities of wax exported the last few years from German East Africa and from the British African colonies are given by the following table:

	Year	Export of Wax Weight lbs.	Value
German East Africa	1911	802,347	$197,175
Gambia	1912	19,498	5,602
Nigeria	1912	12,862	1,875
Uganda	1912-1913	263,408	
British East Africa	1912-1913	139,207	36,630
Nyasaland	1912-1913	110,609	26,675
Soudan	1912	43,704	11,585

Wild beeswax, when well purified, is comparable to European wax. The Central Administration of the Belgian Congo had some samples of wax from the Colony examined, and among them many of good quality were found. Bees are widely spread in the Belgian Congo. The natives extract honey, but do not make any use of the wax, the value of which is unknown to them.

Beauharnois, Quebec, Can.

NIX ON THE SOLAR

BY W. J. OATES

I consider the solar wax-extractor the biggest nuisance in the apiary. In the first place, it does not put either the wax or honey in *merchantable shape;* next, in outyards, where the cappings are left to melt out, and you are not there for ten days, they condense all the moisture in the atmosphere, and your *honey is sour.* Then it's one of the stickiest messes to clean that ever was.

The cost of glass is a big item, unless everybody else plays in better luck than myself. What the carelessness of the help, and wind, and mischievous boys, etc., all thru the experience of 20 years they are by far the most expensive thing to keep up connected with beekeeping when one figures the usefulness of them. But away and above all the foregoing objections is the fact that they are the worst disseminators of disease we have. In my duties as inspector I can trace the loss of hundreds of colonies to the solar extractor. Combs full of disease thrown in them are afterward scooped out and put in a box or thrown around any way, so that everybody's bees can help themselves. Over 90 per cent of the solar wax-extractors that I have come in contact with are either leaky or so ill fitting from the moths that bees can get in and perish by the thousand.

A German wax-press costs but little, and it is the finest place for scraps there is, and when it is full one can squeeze out the honey in no time; and it is good and not discolored, or half water, as when left in a

sun extractor. The press can then be put on a fire and melted out right away if desired.

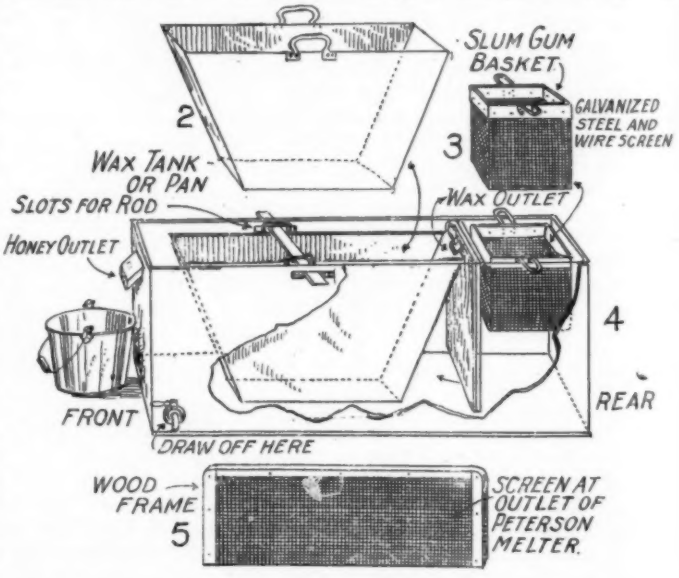
My method for outyards is to let cappings drain as long as I can, or perhaps until the next extracting, then squeeze all the honey I can get out of them. Sack them up, and haul home. At the end of the season, or whenever there is a slack time during the season, I throw them into a large vat with plenty of water and melt down, and dip and strain it into molds at the rate of 1000 lbs. a day, and the "mess" is over with.

Lompoc, Cal.

USING THE SEVERIN SEPARATOR WITH THE PETERSON MELTER

BY J. E. JORDAN

The Peterson melter and the Severin separator are the best two articles which I have yet found to get all of the wax and honey from the cappings at extracting time. To use the Severin separator with the Peterson melter you must elevate the rear of the melter so the melted cappings will run to the outlet. If the outlet of the melter is left as it is at present, small pieces of unmelted cappings will run out and into the wire basket of the separator, and in time will choke it up so it will fail to work properly. In order to prevent this I make a framework of wood to which I tack heavy wire cloth (see No. 5), and place this in the melter across the part where the outlet begins to narrow. As the surface of the melter bows up a trifle, there will be a small space at each end, large enough to allow melted wax and honey to escape, but narrow enough to keep back all unmelted particles. Pieces of cappings will sometimes pack at the outlet. In order to prevent this I have a small paddle handy with which to rake them back every now and then allowing the liquid to pass and go into the separator basket.



For the benefit of those not familiar with the Severin separator I will give a brief description of it. The specifications of it have been given in GLEANINGS, but new subscribers who missed that issue would not have access to it.

The separator is a tank of galvanized steel, 21¾ inches long, 10½ inches wide, 9¼ inches deep. This is the outside tank. There is a partition in one end 5½ inches from the end, which extends nearly to the bottom of the tank. The liquid from the melter drops into the wire basket which strains it, catching all of the dirt and slumgum. The honey, being heavier, goes to the bottom and under the partition; and, when the pan is full, thru the square-lipped opening at the further end. The wax, being lighter, continues to rise until it reaches the lipped opening in the partition, thence into the pyramid-shaped wax-pan. When the day's work is done, beat the slumgum out of the wire basket. This slumgum should be kept in a small can, and at the end of the year's work it should be rendered again to obtain the remaining wax. Do not draw off the honey from the separator until everything is cold. The cake of wax in the pan will be clean, light in color, and ready for market.

When first started to work, the separator should be primed with warm honey over the partition opening into the bottom of the tank, else some wax may find its way into the honey.

Morgan, Ky.

AN EFFICIENT SOLAR EXTRACTOR

BY C. D. CHENEY

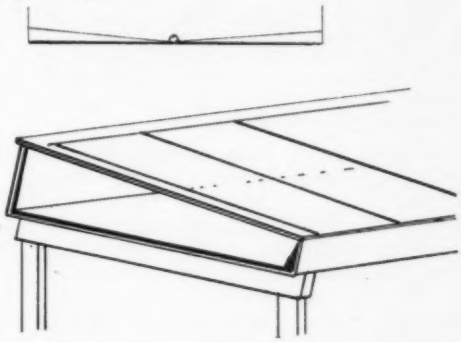
It is a known scientific fact that a bright polished surface radiates much less heat than a dark dull surface. Tin and galvanized iron are materials mostly used for lining the solar extractor, which, in view of the fact just mentioned, are not well suited to the purpose. Therefore, applying the principle, make the lining of "black iron," also known as stovepipe iron. I believe there need be no fear of the iron affecting the wax, nor of any rusting inside. It would be advisable to paint the outside to prevent any rusting there. Put in some sort of insulation (the more the better) between the lining and the case. I would say, preferably several layers of old woolen carpet or horse-blanket, neatly fitted and securely tacked in place before the lining is set in. the lining should fit snugly against the insulation all around.

An apparatus of this kind deserves as much care in construction as any capping-melter or honey-tank, if compensating results are desired. It will be readily understood that the purpose of the black iron and insulating material is to get as much absorption of heat as possible during sunshine, the same to be conserved and utilized to the limit.

Then, departing quite radically from present practice, place the extractor the long way from east to west (assuming it is made longer than wide), with the bottom pitched toward the south; and have the lower (or front) angle of the lining slanted from the ends toward the center, where the outflow should be, at the lowest point, so that the wax can get away from the residue by the shortest route, and find a gutter free from obstruction to the outflow.

Then, again, make the case something like a hotbed frame, shallow at the front and deeper at the back (north) side, say 3 inches at the front and 6 at the back. This may seem rather shallow; but it should be remembered that the combs are melted by the direct rays of the sun, so that piling combs one on another causes a positive loss in efficiency, at the same time causing the melted wax to flow down over unmelted combs where it may be held indefinitely instead of flowing promptly to the outflow.

The main reason for this shallowness is to bring the glass as near to the combs as practicable, and, no less important, to eliminate useless air-space, so as to utilize the solar rays with the least loss and to the best advantage.



If greater capacity is required it would be better to increase the superficial area rather than to increase the depth at the loss of efficiency.

It may be necessary to make a sash specially to suit the sidewise pitch; but aside from this no additional cash expense is involved. No crevices or openings should be allowed—in fact, a solar should be as nearly air-tight as possible, not considering the outflow. The sketch will make the description more plain.

Hoboken, N. J.

THE CHANGES WHICH OCCUR IN THE EGG

BY DR. JAS. A. NELSON

[A book has been recently published by Dr. James A. Nelson, of the Bureau of Entomology, entitled "The Embryology of the Honeybee." We gave an editorial notice of the book on page 966 of our December 15th issue, and the same is now advertised in our columns. It is evident that beekeepers have supposed this work to be too technical to be of any practical use. As a matter of fact, it can be and should be of immense help to them. In order that the reader might have some idea of what it is, we have asked Dr. Nelson, the author, to tell us very briefly some of the things that are in the book, especially those relating to the changes that occur in the egg. This is the time of year when beekeepers can take a look into the hive and see some of the things that Dr. Nelson describes.—ED.]

The editor has suggested that I write for the readers of GLEANINGS a brief summary of the results embodied in my book "The Embryology of the Honeybee." This is a difficult task, since changes which take place in the egg are so wonderfully intricate that they cannot all be successfully condensed into a summary which would not seem dry and technical. Instead I have endeavored to sketch certain phases of the

development in the egg, which may be of special interest to the beekeeper.

The vital processes which take place in the egg of the bee after it is laid, and by which it becomes a larva, are as much a mystery to the average beekeeper as are the problems of human consciousness or the extent of stellar space. It is to be feared that to him an "egg is an egg," just as in Wordsworth's much quoted lines in "Peter Bell:"

> A primrose by a river's brim
> A yellow primrose was to him,
> And it was nothing more.

One of our leaders in science, a well-known university professor, used annually to quote to his classes the following lines (and does yet, for all we know!):

Flower in the crannied wall,
I pluck you out of the crannies;
I hold you here, root and all, in my hand,
Little flower; but if I could understand
What you are, root and all, and all in all,
I would know what God and man is.

This is surely a more reverent attitude to take in the presence of the miracles of Nature.

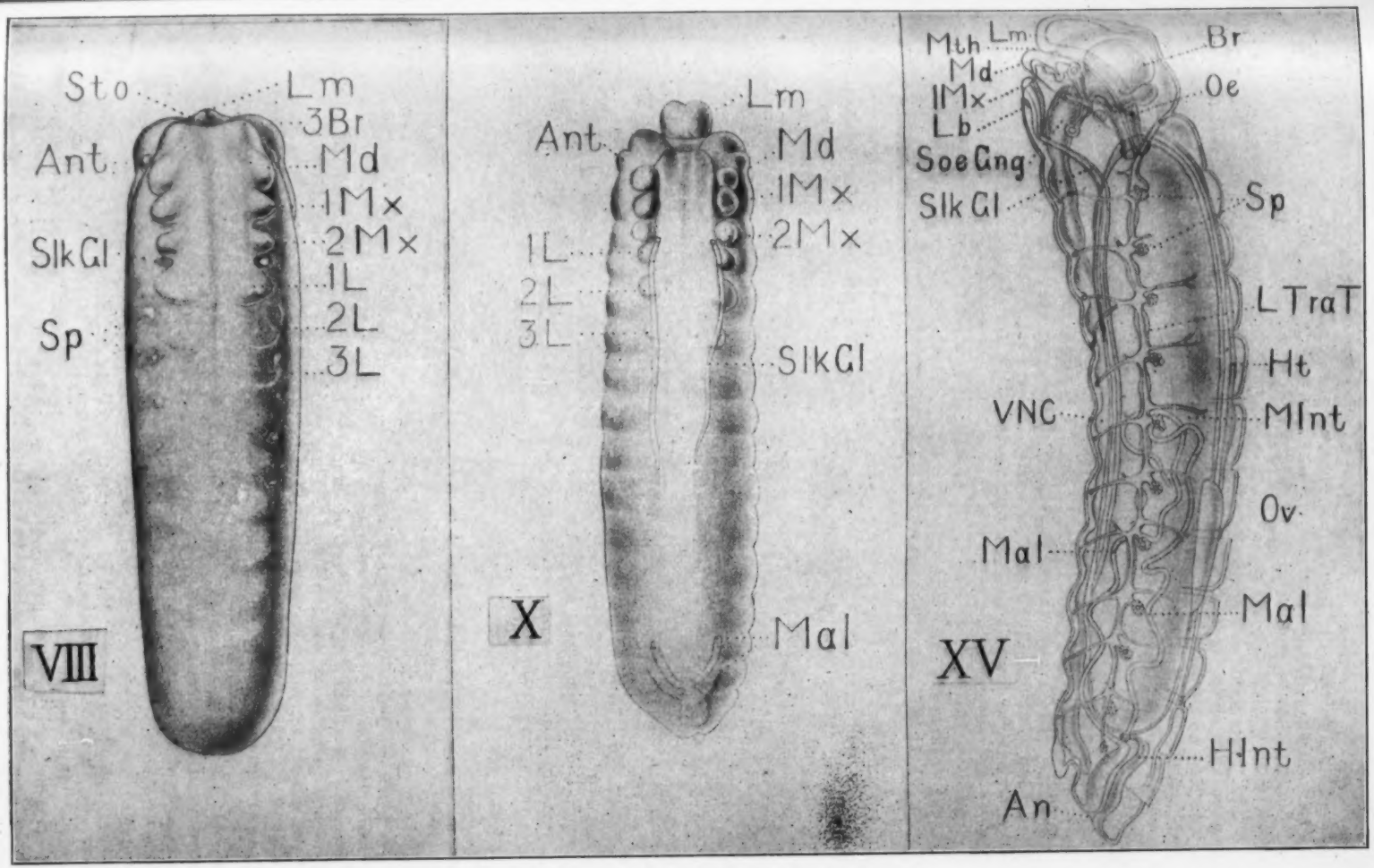
It is not possible to know or understand all that takes place in a living organism; but by patient investigation we can learn to know much, and this knowledge is of inestimable value, even altho it teaches us to recognize only the infinite extent of the mysteries of Nature and the relatively infinitesimal extent of human knowledge.

An investigation of the development of the bee's egg of course brings to light many interesting and curious facts. Among them one of the most striking is the rate at which development proceeds, or, rather, appears to proceed, since we can judge the rate only by what we can see, and we have no means of valuing the amount of energy required by the different developmental processes. The whole course of embryonic development may be divided into two periods: 1. That in which is prepared the material required for the formation of the embryo. 2. The actual visible construction of the embryo from these materials.

The bee-egg, like every other egg, commences its embryonic development as a single "cell." This "cell" is the unit of structure in all living organisms, and for present purposes it may be considered as a minute portion of living substance, having the power to reproduce its kind by self-division. This cell is in the bee egg imbedded in the yolk, which makes up the bulk of the egg, the entire egg, of course, being enclosed in a thin and tough membranous shell, the "chorion." This single cell divides into two cells, these into four, and so on until a considerable number are scattered thru the yolk. Then these, still continuing to divide, come to the surface of the egg and, "joining hands," so to speak, form a layer all over the surface of the egg, and this layer by a further increase in the number of the cells becomes a sort of skin, the "blastoderm." The number of cells making up the blastoderm is several thousand at least. In regard to their shape and arrangement, they may be imagined as extremely minute paving-stones. This stage is not reached until about thirty hours after the egg is laid—much more than a third of the time required for complete development, 76 hours. During the next fourteen hours the blastoderm becomes folded lengthwise of the egg in such a way that three layers of cells are formed over the whole length of the egg on its longer curved side. A number of cells are also heaped up at the two ends of the egg, and these last cell-heaps are destined to form the entire stomach or "mid-intestine" of the larva. This closes the first period. The materials for the construction of the embryo are now all prepared and laid in the proper places. It is important to note that the egg is now nearly two days old (44 hours), and that all this time has been consumed in the preparation of the material. During the next 32 hours, Dame Nature gradually molds these materials into the form of a bee-larva. At 46 hours (Fig. VII.) the rudiments of the brain and of the appendages—mouth parts (Md, 1Mx, 2Mx) and legs (1L, 2L, 3L)—make their appearance as rounded swellings. The mouth (Sto), the silk glands (SlkGl) and the tracheæ (Sp. —) also show themselves as pits or inpushings of the surface layer (ectoderm). The remainder of the development consists principally in the elaboration and completion of the parts already laid down as rudiments.

The material required for formation of the cells themselves, and the fuel necessary to supply the energy expended by them in their movements and subsequent metamorphosis into organs and tissue, is furnished by the yolk, which gradually shrinks away from the ends of the egg, and, later, from its lower side. Finally the yolk becomes enclosed by the mid-intestine (stomach) of the future larva and is then completely digested.

One of the first external evidences of commencing development is the shortening of the egg within the egg-shell, and the spaces left at the two ends of the egg, between the egg and the shell, are filled with a clear fluid. The egg continues to shorten



Some of the changes that take place within the egg of the bee.

slowly while the embryo is developing. At hatching, the embryo, now a completely formed larva, suddenly lengthens, and after hatching is considerably longer than the egg from which it came (Fig. XV.).

The process of development has been spoken of above as a molding process, guided by an external force, and so it seems at first glance. It is, however, much more wonderful, since it is really accomplished by the cells themselves, each of which has its proper destiny to fulfill, whether it be to form a nerve-cell, a skin-cell, or a stomach-cell. One is almost tempted to think that every cell "knows what to do"—where to go and what form to take—so accurately do the cells, at first all alike, group themselves and change in accordance with the duties they have to perform. It is like a colony of bees, some of which act as guards, some as nurses, some as gatherers, etc.; only in the egg the organism is much more precise and the final effect much more harmonious and complete. This is the real riddle of development. It still remains unanswered.

Some one may ask, "What good is such knowledge to the beekeeper?" The answer is that it is of no *immediate value,* in dollars and cents; but that to make effective progress in beekeeping a thoro scientific knowledge of the bee is necessary, and this knowledge comprises the anatomy, the behavior, the physiology, and the development of this insect. No intelligent beekeeper will deny that a knowledge of the structure, development, etc., of the larva might become of great practical value in queen-rearing, and yet the larva cannot be thoroly understood without knowing its earlier development in the egg. Moreover the thoro study of any scientific problem, especially if it relates to an animal or insect of practical importance, is reasonably certain, sooner or later, to prove of value, often in the most unexpected way. The greater part of our marvelous advances in applied science and invention rest upon a basis of investigation which in its beginnings held no promise of ultimate commercial value. For example, the study of entomology for many years—in fact, up to quite a recent time—was regarded as merely an intellectual diversion for cranks having leisure and means. Yet the work of these supposedly harmless lunatics forms the basis for the tremendous annual saving to the farmer and fruit-grower by the prevention of insect injury.

The table given below will serve to summarize the brief account just given, and shows the principal changes taking place in the egg, and its age in hours at the time that these different changes take place.

TABLE SHOWING RATE OF DEVELOPMENT IN THE EGG OF THE BEE.

Age in hours	Stage of Development
1-16	Cells increase in number by repeated division.
16-30	Cells unite on surface of the egg to form blastoderm.
30-44	Blastoderm folds to form germ layers. Formation of embryonic membrane. Preparation of materials completed.
46	Rudiments of mouth parts, legs, brain, and all important organs become visible. Fig. VIII.
54	Mouth parts, legs, and organs well advanced in development but not complete. Fig. X.
76	Development of egg completed. Egg hatches. Fig. XV.

MASSACHUSETTS MEN INDEPENDENT

BY B. N. GATES, SEC.

A most successful meeting of the Hampshire, Hampden, Franklin Beekeepers' Association was held in the Board of Trade rooms, Springfield, Mass., on May 13. This, the annual meeting, was postponed from March 16, when it was to have been held in Amherst in conjunction with the beekeeping meetings during Farmers' Week.

Much the same program was followed. The election of officers resulted as follows: President, C. M. Smith, Florence, Mass.; Vice-presidents, A. C. Andrews, Hayes Ave., Chicopee, Mass.; Rev. D. D. Gorton, W. Springfield, Mass., and L. R. Smith, Hadley, Mass.; Secretary-treasurer, B. N. Gates, Amherst, Mass.

Among the other official business was the amendment of the constitution, whereby action of June 13, 1912, for the affiliation of this society with the National Beekeepers' Association, was rescinded. Unanimous vote also re-established the annual fee to fifty cents per annum. Further modification of the constitution and by-laws was of minor importance.

Among the papers read was the annual address of the President, C. M. Smith, who presented numerous "Timely Suggestions to Beekeepers." By way of a report of progress for the committee on honey-labels and standard packages, Dr. B. N. Gates, chairman, explained what constitutes an attractive label. Mention was also made of the standardization of honey-containers, particularly small glass containers. After the report, discussion followed, wherein it

was particularly emphasized that beekeepers give more and more attention to supplying their customers sixteen ounces for a pound package and eight ounces for a half-pound package. It is being considered by the association to adopt a label which members of the association may use. This attached to their products indicates their affiliation with the local society and is thought to be of advantage in selling local products.

A most interesting address followed by A. W. Yates, of Hartford, Ct., entitled "Spring Handling of Bees."

A committee consisting of the president as chairman, the three vice-presidents, and the secretary-treasurer, was appointed to wait upon the managers of the agricultural fairs for the purpose of obtaining proper recognition of beekeepers for displays of beekeeping products at these fairs. It was left to the Executive Committee, and the Secretary particularly, to arrange for the society to hear Mr. C. P. Dadant, of Hamilton, Ill., when he visits the East next August. This will constitute the field meeting of the association.

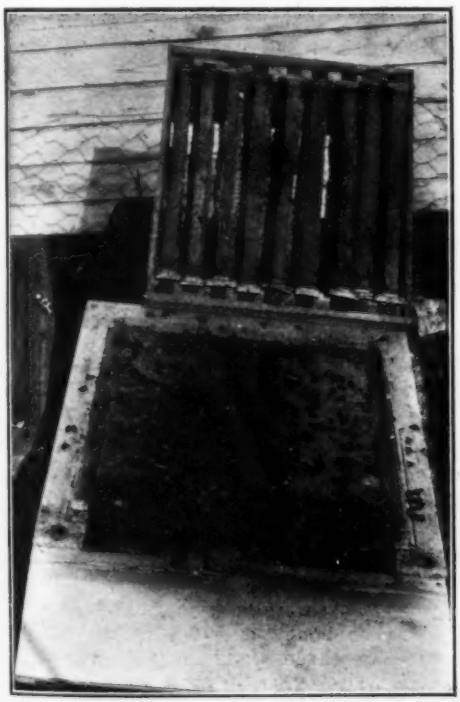
The meeting adjourned shortly before five o'clock, there having been a good attendance.

Amherst, Mass.

ISLE OF WIGHT DISEASE SHOWS VARIOUS SYMPTOMS

BY B. BLACKBOURNE

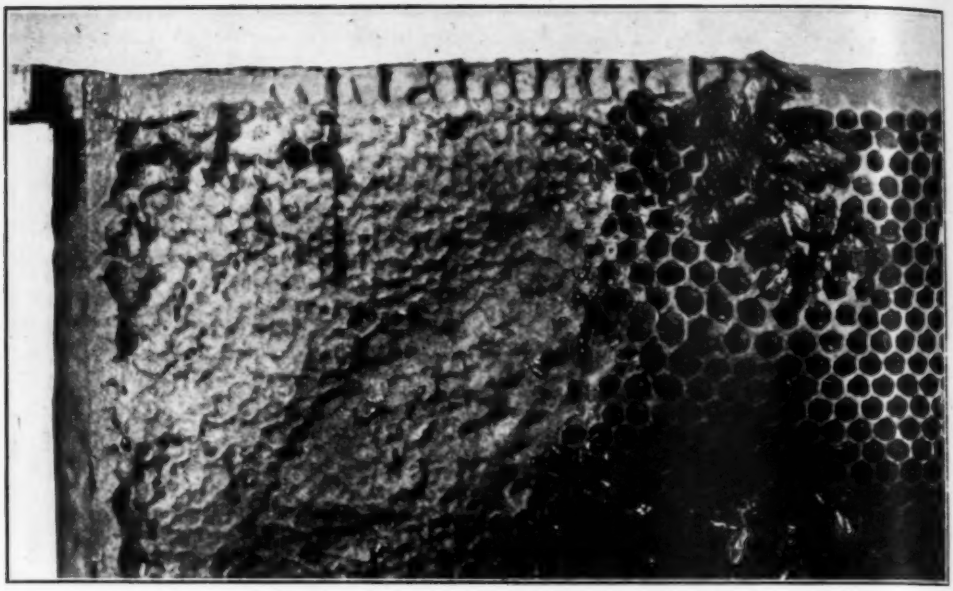
One of the peculiarities of the Isle of Wight disease is the different symptoms exhibited by different stocks of bees suffering from it. In some cases the sick bees appear shiny and black, active on their legs, tho unable to fly. In others they are sluggish, with swollen abdomens and dislocated wings. Some stocks die out in a few weeks, while others hang on for months, and still others will be found almost completely depleted of bees without having shown any crawlers or dead bodies in front of the hives.



Dead bees on the floor of a hive containing a colony badly affected with Isle of Wight disease.

In the spring of 1913 I was greatly disturbed by seeing crawlers and sick bees being thrown out of my hives, and took it for granted that I had microsporidiosis. As the year advanced, however, these symptoms disappeared, the bees did very well, and appeared in normal health, so I concluded the trouble was a touch of paralysis. The next year the same thing happened; but that one stock, which did not appear to be doing much work, when examined was found to consist of brood from top to bottom (20 standard frames), and the queen laying freely, but not an old bee in the hive. Where had they gone, for there were no dead outside?

In 1915 there was no doubt that I had the real thing. There were always numbers of bees hopping about on the grass, trying to fly, and the characteristic mud-colored excrement was in evidence practically all over the hives. The worst affected was the strongest stock, which required supering, and built queen-cells in preparation for swarming long before any of the others. Practically all the stocks were affected, tho some only very slightly. Just before fruit-bloom I had to go away from home for a time, and left my apiary in charge of a young man who had been with me for a couple of years. It is a curious fact that diseased bees are frequently given to excessive swarming, and my man was kept busy hiving swarms. Very often the swarm will show the characteristic symptoms before the stock from which it sprang. Presumably this is because the greater proportion



A little group of bees in the last stages of Isle of Wight disease.

of bees in the colony are old ones, having the disease in a more advanced stage.

One stock is especially worth mentioning. It consisted of Italian bees, did extremely well, giving me an 8-lb. swarm and over 100 lbs. of honey (which is good here), and did not show a sign of disease all thru the year. I began to think that there must be something in the immune theory, for here, surely, was an immune stock. I took care to tell my beekeeping friends all about it. Alas for my hopes! late in the autumn I lifted the quilt and found not a handful of bees left. There were just a few with the queen clustered on one frame, similar to those in the photo.

As I expected to be leaving the country before the spring, and most of the stocks appeared too weak to winter, while it was out of the question to sell them, I sulphured all except three of the strongest. One of these to which I had introduced an Italian queen is still alive, but diseased, and this will have to go the same way as the others.

I may say that I have tried some of the so-called cures, but have no faith in medicinal treatment. Those who are investigating the disease on behalf of the Board of Agriculture believe that they have discovered a drug that will cure the trouble, and are to experiment this year with 40 hives. If it were possible to treat all the bees in the country at one and the same time there might be some hope of success; but even supposing some stocks are cured, what is to prevent them becoming reinfected as soon as the treatment is stopped? One cannot always be feeding bees.

Ramsgate, England.

THE PORTABLE EXTRACTING-OUTFIT VS. THE CENTRAL PLANT

BY J. F. ARCHDEKIN

It was our intention at first to do all our extracting at home, using a car to move the honey home and take the combs back. After we arrived here and considered the problem very thoroly we changed to a portable outfit. We run a six-frame power extractor, and use a sectional wire-cloth house, 6 x 8 feet, with a canvas cover to work in. It is very cool; and all the machinery, including the house, is moved in three loads on the Ford. The outfit can all be set up and made ready to run in less than half an hour, and then all our work is right at hand, nothing depending on what two or three men several miles away do or don't do. The honey is run into barrels, and these are taken along on trips home from work. Of course we have some exasperating delays when some necessary article is left at home, or when something gets out of

fix. Nevertheless, I believe thoroly in the portable outfit.

A central plant is a fine thing, and one can have it arranged more conveniently than a movable one. The greatest trouble is that it is more or less distant from a considerable part of the honey, and this fault is fatal. If the men who take off the honey shirk, it delays things. The car may have an accident, and lose more time. Or the extracting force may get behind, and the honey pile up on them. Then the owner needs to be present in all three places to get the best results. When anything gets out of fix, hired men are apt to sit down and talk it over unless the boss is there to speed things up.

A car will stand up well the first year hauling honey home; but it nearly always develops trouble the second year. Every mile a car is run is that much of its life gone; and if it carries heavy loads most of the time, its life is still further shortened. If a hired man drives it he is not going to be any too particular with it either. Then there is the cost of gasoline and tires, and at present prices the gas-bill is quite an item.

Bordlonville, La.

MY SYSTEM OF SWARM CONTROL FOR COMB-HONEY COLONIES

BY G. C. GREINER

With the exception of a very superficial examination as early as the weather will permit (it took place April 7 this year) to make sure that all colonies have plenty of stores to carry them to the first natural-honey sources of our locality, I do not molest my bees until the apple-trees are in bloom. Then they are thoroly inspected and graded for spring management.

If I can judge other beeyards by my own they all consist at this time of these three classes: Strong, medium, and weak. According to the way they have wintered, one or the other end of the line will predominate; but the three classes are there just the same. The two latter groups are run for extracted honey; and by keeping them well supplied with empty combs in their supers it is no trouble to keep them from swarming.

The colonies in the first class (the strong) include everything that has six, seven, or eight combs of good solid brood, and the hive reasonably well crowded with bees. It is needless to say that the queens must be of the young vigorous type, for the colonies would not have come up to the necessary requirements if the queens had been deficient in this respect. Any of these colonies are likely to swarm almost any time after the apple-bloom inspection, and even if run for extracted honey it is a puzzle to keep them under subjection.

To escape this annoying swarming nuisance the colonies are divided about May 15 to 20, beginning with the strongest, that show from outward appearance any inclination to swarm, until all are taken care of; and they are divided in the old-fashioned way of taking two combs of brood with the old queen from the parent hive, and introducing a young laying queen into the latter at the time the division is made. On account of the earliness of the season, southern-bred queens are used for this purpose. The two combs of brood with the old queen are placed in a new hive with three additional empty combs, and the rest of the hive filled out by three chaff division-boards. These latter are the same thickness as one brood-comb with its bee-space, so that every removed division-board will give room for a brood-comb. This hive so prepared is left on the old stand to catch the flying bees, while the parent hive with its introduced young queen is also filled out by two division-boards and moved to a new stand some distance from the old one.

As soon as the old queen has started brood again in those empty combs, which she generally does in about a week, one of the division-boards is removed, the brood spread, and an empty comb inserted in the center of the brood-nest. In about another week the new comb is again stocked up with brood; another division-board is removed, and a second comb inserted in its place. The same procedure is repeated with the last division-board, so that, by the time the white-clover flow is opening, the brood-chamber is filled with brood, and all the incoming honey has to go into the super. However, it must be remembered that this is only an outline. Time and space will not permit to give all the connecting details, which must be left to the judgment of the operating beekeeper.

The removed parent hive is managed in practically the same way as the newly formed swarm with the old queen. As it takes a few days longer for the introduced queen to be liberated and laying, the exchanging of division-boards for empty combs will be delayed that many days. But

after she is well established in her new home she will keep the empty combs, which are also placed (one at a time) in the center of the brood-nest, well filled with brood; and by the time the white-clover flow begins, these colonies, too, are compelled to store the incoming honey in the sections. From these colonies, if I do not use all of them for this purpose, I select my comb-honey producers. They are in the very best condition for surplus-honey production, without letting their ambition and energy run to swarming. The question, "Why don't they swarm?" is easily explained. They have a young queen which is not likely to swarm; all their working forces are young, ambitious bees, every one being eager to gather honey, and not one old enough yet to let thoughts of increase by swarming trouble its mind. Then by the judicious use of added supers with full sheets of foundation and bottom starters, and a liberal supply of bait-combs, swarming is practically out of the question.

One super at a time will accommodate the strongest colony that any hive contains; but another must be given, when needed, and a third one added whenever conditions require it. It is not the amount of empty super-room given at one time that keeps bees from swarming, but the gradually added working surface as fast as the bees will occupy it. As a rule, to assist bees in drawing out foundation, two supers are all they should have at a time—three for a short time may be permissible. If more room is needed, another may be given below, and the top one removed by means of the bee-escape. This crowds the working forces again on to the new foundation, and keeps them busy drawing out and storing. No matter if there are still some unfinished sections in the upper one, they can be easily finished by feeding after the honey-flow.

Equalizing at the beginning of the honey-flow by way of exchanging heavy combs of honey with adhering bees from the supers of overly strong colonies with empty combs from the supers of the weaker ones will also tend to prevent swarming. I apply this same principle to rows of sections from the supers of the comb-honey producer.

LaSalle, N. Y.

THE IDEAL BROOD-NEST FOR OUT-APIARIES

An Eight-frame Hive-body and Shallow Extracting-super Make an Ideal Brood-Apartment

BY J. J. WILDER

When Editor Root visited me a few years ago we were getting our bees in shape for the first great honey-flow in early spring. He asked whether we were supering the bees at that early date, for all our hives consisted of one eight-frame body and a shallow extracting-super on top. I told him that this was our regular brood-apartment, and we went fully into the merits of such an arrangement. It provides greater bee production, quicker manipulation, and reduces swarming almost to a minimum. At the same time the greatest possible amount of honey is harvested, and of the fanciest grade.

With a good equipment almost any apiarist can produce extracted honey; but it requires more skill to produce comb honey in one-pound sections or bulk comb honey, when it will make the greatest and best pack. This is all the more true when it comes to producing it in a wholesale way with the smallest amount of labor.

I have bees in all kinds of southern locations, and the short cuts to great results has been my aim all the time. There are a great many locations where a single eight-frame shallow extracting-super makes an ideal brood-chamber without any additional room, and there are still a greater number of locations where the brood-nest should never be larger than the capacity of a regular eight-frame hive-body. But in such locations we are troubled but little with swarming, and no great crops of honey are ever expected. It does not require the skill, etc., that a location does where there is a great abundance of pollen, and where brood rearing is kept up at a great pitch, especially at certain times, when the bees contract the swarming fever. Under such conditions it takes an ideal arrangement for the apiarist to cover a great field. This we have in the eight-frame hive-body and shallow extracting-super with the regular frames that go with them. The hive-body contains the regular continuous nest, and this we do not break up any more than we can help. The super we place either over or under this.

This super, with more or less honey, is left on over winter. (Of course in the North, where bees are wintered in the cellar, they could be removed and set away; and

when the bees are set out the following spring the heaviest supers placed on the lightest colonies, thus equalizing stores, without greatly disturbing the bees).

On our first round, which is about the first of March, these are raised up a little at one end, a peep taken at the bees and stores, and if anything is wrong a mere glance reveals it. If the bees should be short of stores they are smoked out of the super, and a heavier one given from some heavy colony, but in most cases the light frames are exchanged for heavier ones, and thus the stores are kept equalized.

Ten or twelve days later the super is tipped up again to see how brood-rearing is progressing; and if the bees are crowding into the super we know all is well. If not, the super is set off and we examine the nest below and mark the colony by laying a stone or a stick on it so that at the next round we may know the ones needing special and immediate attention.

The others in the yard are making progress, and ten or twelve days later we do not tip the super, but just tip or remove the covers. By this time the queens are moving up in the supers, and we can easily find and lift out some frames of brood from the super and exchange them for empty ones in the weaker colonies; but if there should be no bees in the super of the weaker colony this is not done, but the entire super is removed and placed under one in which the queen had made great progress, thus giving her more room at a time when such colonies would soon be contracting the swarming fever.

On our next round, which is only about eight or ten days later, the weaker colonies are ready for a super of sealed brood and therefore they get a super back. At this time the queens in the strongest colonies are occupying all combs not filled with honey. On our next round, six or seven days later, we might expect just a little honey coming in, so the supers nearly filled with brood in all stages of development are removed and placed under the lower story, and a storing super placed on top. On the next round, in six or eight days, many of the colonies are ready for this, and on this round our regular ferring-sticks are placed on the bottom-boards, thus giving the hives a good under ventilation from end to end, the sides of the hives being supported by sticks one inch square and the length of the hives. By the next round all hives expected to go into the honey-flow are thus ventilated. Sometimes a little brood may be chilled and thrown out on account of so much ventilation; but in case of a sudden short cold spell, when we might expect considerable damage from this, the bees are stayed from the field, and they cluster under the frames and completely stop the under current, which saves the brood.

Now, our trips around occur every six or seven days during the spring flow; and at each visit storing room is added in the usual manner, the empty supers inserted next to the brood-chambers. At each visit we tip the hive-body from the super and glance over the brood-nest in both apartments, looking upon and between the combs, and perhaps separating them just a little, the object being to see if any preparations for swarming have been made. If any queen-cells have been started this quick, examination reveals them. If there are cells we stop and go thru the hive and remove them. But we rarely have much of this to do, and but little time is lost in this way. We must make sure of it, however, so we have this little work of tipping up to do.

At this critical time the queen is occupying all comb in the hive-body, for nearly all the honey the bees had at the beginning is in the super, which allows the queen full access to all comb in the body. At the same time, she has more than twice occupied all comb not filled with honey in the super, and she has not lacked room. At the same time, this broad open entrance has kept the bees from contracting the swarming fever, because they have had to protect the brood in the super, during rain or sudden short cool spells, at which time they always contract the swarming fever if they are in closed-up close quarters, for they seem to have nothing else to do. With an open hive, with brood right at the bottom or almost in the open, conditions are right the reverse, and it seems to cure and keep them cured of swarming.

When the honey-flow is coming to a close, and the supers are nearly all filled, the super is removed from the bottom and placed on top of the body; and as the queen at this time is fast diminishing in egg-laying the bees will store some honey in it, the amount depending, of course, on the extent of the flow, and thus they have sufficient stores; and if there is not another great honey-flow expected, the super is left on top the remainder of the season. In it the bees will store the odds and ends of small or light honey-flows. This leaves them heavy with stores, and in the best possible condition for the coming season.

Suppose increase is wanted at any time. What is more ideal than the arrangement I have described? When the brood in the

super is nearly all capped and some emerging, just set it on a new stand and contract the entrance, making sure the queen is left with the colony on the old stand. At the same time give the new colony a ripe queen-cell, or, better, a queen; and when the little colony is ready, give it a body of ready-built comb or full sheets of foundation, and soon they are a normal colony in strength.

If a great amount of increase is desired, the strongest colonies should be given an extra super in the early spring, and the queen allowed to occupy both as early as possible. Later, when some brood is emerging, use the best super for the increase.

This super is never used as a storing-receptacle by the bees as long as it remains *under* the body and it is quietly out of the way and well protected while left there.

Some might think that serious robbing might result in such wide-open hives; but such has not been my experience, for the colony has a good chance to ward them off, and at the same time a great swarm or army of robbers will not attack such a colony.

Cordele, Ga.

COMB HONEY IN A CALIFORNIA OUT-APIARY

BY C. T. AND M. B. WISE

We run two out-apiaries for comb honey. Our Kentucky Springs apiary (so named from the spring which furnishes water for the bees as well as ourselves) is situated about eight miles east of home, and is usually visited once a week during the working season. The trip is made in a buggy or light wagon, and it usually requires two days to attend to the work (100 colonies). We camp over night at this yard.

The other yard is two miles west from home, and is usually visited twice a week, making the round trip on the day of each visit.

As soon in the spring as the bees begin to crowd the brood-chamber a second hive-body is placed on the hive. In this second body should be placed all combs from the colony that are filled with honey, and the space so made in the lower hive filled with brood-frames containing full sheets of foundation or drawn combs. We get better results from using foundation on the stronger colonies, and usually reserve our extra drawn combs for use with the weaker colonies. Should the hive contain brood in all frames when the second body is added, put about half of the brood in the upper hive, proceeding as before. When foundation is used we get better results by putting the foundation together as much as possible, as the bees make better combs when several sheets of foundation are side by side than when they are alternated with drawn combs.

A week or two later both hives should be well filled with bees and brood. If they are not so filled at the next visit, leave them until they are full of bees, brood, and honey. We then place the combs containing the greater part of the honey and well-ripened brood in the top hive with one comb in the center of the hive that has eggs or very young larvæ suitable for rearing queens.

Now set the top hive to one side and put a *baited* comb-honey super on the lower hive and a second comb-honey super containing foundation upon that; next put a queen-excluder or a screen with a fly-hole two inches wide on the last comb-honey super (we get best results with the screen); place the top hive on this stack, and leave it for one week.

We then carry the upper hive to a new location and introduce a young queen if we have one. If we have no queen to introduce we leave them to raise one from the cells within their own hive. At the time of carrying off the top hive we examine the comb-honey supers before placed on the parent hive. If the bees have accepted them and gone to work we lift the baited super off, placing the one with the foundation beneath it, and put a third empty super on top. When the bees begin to work in their *third* super we put it at the bottom, and so continue thru the season.

Our seasons last, in favorable years, from May to September, and we sometimes have ten or more unfinished comb-honey supers on a hive.

After the bees are working in the third super we seldom find any inclination to swarm; but when we first carry the upper hive away the bees sometimes refuse to go into comb-honey supers, when we "begin at the beginning," and repeat the treatment. When handled by this method I do not believe we have more than one per cent of swarms ordinarily, but in 1915 we had 90 per cent of our bees to doctor for European foul brood, and endeavored to hold them strong for comb honey and requeen by rearing queens (by introducing cells) in the sick hive at the same time. As a result we lost about 15 per cent of prime swarms, as we judged by condition of the hives later.

Acton, Cal.

Heads of Grain from Different Fields

THE BACKLOT BUZZER

BY J. H. DONAHEY

Uncle Jeremiah Motherwort is doing a lot of worrying this spring. He read in the bee-book that extra-fancy sections were to be evenly filled and all combs firmly attached to the four sides. He says he don't know how he is going to hand the information over to the bees.

The Bee

Thou risest ere the rosy hands of morn
Have brushed the glowing dew-drops from
the thorn,
And on thy wings of frailest gossamer
Thou fliest far where rarest blossoms are.
Across the fields of clover dost thou pass,
Across the wild sweet flowers in the grass,
Across the apple orchards pink and white,
Across the garden riotously bright.
Thou gatherest from every bud and bloom,
And, in the hive's secluded, dusky gloom
Where thou hast fashioned with omniscient
art
The cells in whose design man had no part,
Thou blendest all the sweetness thou hast
brought
Into a harmony beyond man's thought.
Thou soon must die; but, oh thy great be-
quest,
Field, garden, wood, in one great thought
compressed!
Thou teachest man to draw the best earth
yields
Of wholesome wild and cultivated fields,
To blend all knowledge in a thought sublime,
And, dying, live in his bequest to time.

Brunswick, Ga. Annie O'Conor.

The Fowls Method of Swarm Control.

I read the editorial, July 15, "A New-old Method of Swarm Control," inviting discussion relative to the Fowls plan, but I have seen nothing in Gleanings about it since.

Taking the hint from the first Fowls article I tried a few colonies last summer. The main objection I had to it, with my very limited trial, was that the queen did not get sufficient support during the time that treatment was in progress; in fact, none in some cases, which is not to the best interest of the colony.

There is no denying the fact that the old hive with combs and brood has a great attraction—in fact, more than the queen with one frame as mentioned in the plan and under new conditions that it makes. This attraction is stronger in some colonies than others. I remember once placing the queen with one frame of brood in a prepared hive, and setting it on old stand. I shook about half of the colony in front; put the rest of them on top with a wire separating-screen between, and gave a small back entrance. The bees practically abandoned the lower for the upper. It was a sight to see them string around to that small back entrance. Imagine the support this colony would have given the queen under the plan in question. If the queen gets little or no support, and is removed from the parent hive a distance of two supers or more, as advised, and she ceases laying, it then resolves into about the same condition as having her caged for the time, and the caging of the queen has been practiced and advocated as swarm prevention. Then in the end the plan means division, and division in any manner has a very marked effect on swarming, which is not questioned.

If the Demaree plan or its modifications (which these all are) has any advantage over the shaken-swarm plan relative to swarm control, the placing of the excluder, an obstruction to the free movement of the queen, and lack of support from her bees on account of attraction above, can lay a pretty strong claim for the difference. Of course, if, finally, division is made, it is an added factor.

Galena, Kan., Jan. 31. J. P. Brumfield.

[The Fowls plan was either so good that it required no discussion, or it was no good at all. We hold that it is good. We would like to know who tried it and with what success. —Ed.]

"Water-soaked" Wax.

Some of my neighbors are having trouble in rendering wax from old black brood-combs. They melt the combs (with water) in five-gallon cans. Part of the wax crumbles and looks like cornmeal, and will not stick together.

Is there any simple way of making dark wax lighter-colored, without using sulphuric acid? I have tried vinegar on a small scale, but it did not seem to have any effect on the color. Perhaps I did not use enough vinegar.

Wm. Muth-Rasmussen.

Independence, Cal.

[The wax referred to is water-soaked. Beeswax, when it becomes mixed with water, assumes a crumbly, mealy consistency so that it is difficult to get it back into hard firm beeswax again. You can expel the water by using dry heat—that is, placing this mealy wax in a suitable dish and holding it over a slow fire until it melts. The water and wax will then separate and the wax will be hard.

Water-soaked wax is a physical mixture of wax and water and not a chemical mixture; that is, the wax itself is not changed except in shape, being in small particles separated by thin films of water. After being kept a long time in the air this water will all evaporate, leaving the wax as a powdery substance bearing little resemblance to beeswax. This, however, can be brought to a firm condition by the dry heat above mentioned.

We do not know of any way that beeswax can be clarified on a small scale without an expenditure of an unwarranted amount of money. You can melt the wax, dip boards in it, peel the thin films of wax off the boards and expose them to the sunlight, and whiten the wax, then melt again and strain; but the additional amount that you could get for the wax in the clarified condition would not begin to pay you for your expense in bleaching. Furthermore, the bleached wax is not quite as ductile as that which is not bleached. We have never been very successful in experimenting with vinegar. Sulphuric acid is all right to carbonize the impurities, but we do not advise the use of this chemical except when one has access to steam and a properly built lead-lined vat or tank, and even then the acid should be used in extremely small quantities. The average person who attempts to clarify small amounts of beeswax with sulphuric acid uses ten, twenty, and sometimes even a hundred times too much acid. The wax is "killed" and almost ruined.—Ed.]

Surely "Penny Wise and Pound Foolish."

Not many beekeepers in Jamaica possess this useful machine. Year after year they extract the wax by boiling the comb and wringing it thru a bag. The result is, they lose about half their wax by this primitive method.

Not many weeks ago I called on a beekeeper, and in conversation he told me it scarcely paid for the trouble to melt up very old comb, as there was very little wax to be got out of it. On asking him what method he used to press the melted comb he said, "By wringing it thru a bag." He had melted up fifty supers of comb (500 frames), and got only 50 lbs. of wax. I offered him four shillings for the refuse, which he accepted. On taking it home I boiled it with plenty of water and pressed it thru a steam wax-press. Pressing two gallons of the melted comb each time gives the best results. I also find by pouring about a quart of boiling water on the bag containing the melted comb each time it is turned for pressure is important. The boiling water softens the cocoons, and washes out the wax. After I had got thru with the melting and pressing of the refuse, the wax weighed 50 lbs.; at 13½ pence per lb., $13.50—not a bad day's work. I earned nearly enough to buy friend M., who sold me the refuse, one of these useful machines.

F. A. Hooper.

Four Paths, Jamaica, B. W. I.

Hydrogen Peroxide to Cure Bee Paralysis.

Last fall my colonies were seriously depleted by the "whatever it is" disease. We were having fine weather, the bees working on asters one day and the next rolled out in front of the hives to die. They went into winter with no brood (October) and few bees, but all wintered. I have heard of others in this vicinity that rolled out thru the winter and died. Just before fruit-bloom we had three cold rainy days, at the end of which I found my bees rolling out over the ground, forming little clusters on dead weeds or sticks, some hopping over the grass, and some spotting or streaking up the front of hives, also the entrance-boards. I fed them—poured on top the frames and bees warm sugar syrup with two to three teaspoonfuls hydrogen peroxide to the pint, and controlled the disease, or think I did. The treatment was repeated two and three and four times a day for two days, and a pint can of the medicated syrup with cloth cover inverted over the frames and surrounded by packing. The third day there was only an occasional hopping bee, and they were busily working on the barberry hedge. Peroxide has been my standby in the poultry department. One teaspoonful poured down one sick hen generally cures her. As to the bees, not only do I not want to change queens because my own bees are more than satisfactory, but the plan doesn't look good to me. One could not be sure that the new queens are immune. Indeed, those colonies of my own suffering the severest last fall, had much the lightest attack this spring, and vice versa.

May G. Alley.

Pine Grove, W. Va., May 1.

[Bee paralysis and Isle of Wight disease seem to resist many kinds of medication. Reports have shown that bee paralysis, or what was like it in this country, has yielded in some cases by sprinking powdered sulphur on the bees. As sulphur is a mild antiseptic it may have some curative value. In the same way hydrogen peroxide may be used also. As nearly every family keeps it on hand we suggest that it be tried out.—Ed.]

A. I. Root

OUR HOMES

Editor

Love ye your enemies; bless them that curse you; do good to them that hate you, and pray for them which despitefully use you, and persecute you.—MATT. 5:44.

Father, forgive them; for they know not what they do.—LUKE 23:34.

Behold the Lamb of God that taketh away the sin of the world.—JOHN 1:29.

If thine enemy be hungry, give him bread to eat; and if he be thirsty, give him water to drink; for thou shalt heap coals of fire upon his head, and the Lord shall reward thee.—PROV. 25:21, 22; ROM. 12:20.

In our issue for July 1, 1915, I inserted a clipping from the *Sunday-school Times*, headed "Getting Even." That little clipping has been of so much importance to a sinful world that I am sure our friends will excuse me if I give it once more right here:

GETTING EVEN.

To get even with one who has wronged us is to get down as low as he is. The more outrageous his injustice, the lower we shall have to go if we insist upon getting even with him. So "getting even" always leaves us worse off than we were before. If ever one man was unfairly treated by another, it was David, at the hands of jealous, unworthy, infuriated Saul. But when David's chance to get even came, he preferred to stay on the heights. To "revenge" ourselves is to return the sort of thing that was given to us. It is as tho, having been cheated by counterfeit money, we wait for an opportunity to pass some of the counterfeit back to the cheat. No matter what we have suffered, we cannot afford to do that; for then we have been injured twice; and the second injury is far worse than the first. There is a better way of getting even with one who, in order to harm us, has descended to a low level. It is to stay above him in God's company, and by love to bring him up to that level.

My reason for presenting it a second time is because of something that more powerfully illustrates the admonition to return good for evil than anything, so far as I can recall, that has ever come to my attention. It is *also* a clipping from the *Sunday-school Times* in regard to a great missionary, and reads as follows:

What a great, burly, bewhiskered silent man he is! He will weigh over two hundred and fifty pounds. Once he and his wife were put in the stocks and beaten with the Russian scourge. When the beating was over he was unconscious and his wife was dead. He inquired from what section the Cossacks had come who had beaten him and murdered his wife, and he journeyed to their section; that was five years ago, and he has since baptized eleven hundred of them. And they were converted, too, and gloriously so; for each one of these more than eleven hundred have put their property and lives in jeopardy by professing faith in Christ and by being baptized in his name. Is not this a present-day example of the grace of God that came by the Lord Jesus Christ?—*Baptist World*, Louisville, Ky.

There you have it, friends. If the above is not "getting even" with a vengeance, then I do not know. It is really too bad that the *Baptist World* did not give the name of this saintlike missionary. He was not only beaten, like God's veteran apostle Paul (and probably left for dead), but his poor wife was *killed outright*. We have been told the American Indian never forgets an injury. Well, suppose this missionary, after he recovered, had spent five years of his life in killing Cossacks; and suppose he had succeeded in killing, say, eleven hundred. I am quite sure the great wide world would have smiled when it heard of it, and said, "He pretty well balanced the account." But the poor fellow had different ideas of revenge. He first inquired in regard to what section of the Cossacks had done this great injury. Then deliberately, quietly, and prayerfully, he set about getting his revenge—that is, getting what might be called revenge. But his ideas of revenge were along the line of the beautiful texts I have quoted—"Do good to them that hate you; bless them that curse you, and pray for them that despitefully use you." We have heard about heaping coals of fire on one's head; and our mothers and teachers have explained to us that the "coals of fire" represent good deeds. Probably those very Cossacks that committed that atrocious crime were ignorant, like our poor brothers in Mexico, for instance. They did not understand this missionary. They thought that he and his good wife were enemies. Quietly, but with a strong determination in his heart to win them to Christ, he went to work, and, probably to his great surprise, he found these poor people ready to receive God's precious word; and in only five years he baptized *eleven hundred*. We are not told that he succeeded in laying up treasures on earth; but, oh dear me! what a "heap" of treasure he laid up for himself "in heaven"! Eleven hundred precious souls singing praises and thanksgiving to him for having led them out of heathen darkness into the light of the gospel!

The above has been added to our little tract about the defeat of injustice, etc.; and may God speed the message. Let me digress a little:

A good lot of people, both men and women, when they are getting old like myself (past threescore and ten), are tempted at times to think their work is done—that the great responsibilities of the present age will have to rest on younger shoulders. Did you ever feel that way, my aged friend? Very likely you have. Well, up in Michigan there is a lady (I think she said she is over

eighty years old) who cannot get about very well, but who can distribute tracts, and she has been making excellent use of the little tract I have mentioned—"The Defeat of Injustice." Here are the closing words of one of her letters:

I have thought it best not to watch for fruits, like Jonah; but if I am working the will of my heavenly Father, and it is acceptable to him, if I do not *see* results or people—yes, people who make a high profession do not seem to approve and encourage, as might be expected of them—I try not to be disheartened. I left the word "discouraged" out of my vocabulary long ago. I do not use the word at all except to *tell others* to leave it out.

Ypsilanti, Mich. RHODA C. W. DERBYSHIRE.

What do you think of that, friends, young and old? The word "discouraged" is left out of her vocabulary. Is not that an exhibition of faith? Well, after getting several hundred of my tracts, and seeing them bear fruit, she sent me one of *her* tracts. I think you will read it all when you get a glimpse of the title, and then you will smile as you go on.

WAR ON CHRISTIAN PRINCIPLES.

One of the conditions of the treaty with Mexico, it is said, that in any future war which may break out between the two countries shall be conducted on Christian principles.

Now, we all know that this is an age of progress, and that all sorts of improvements are constantly taking place in all sorts of matters; but war on Christian principles is certainly the latest, and if it be carried out we think it will prove the greatest of them all.

Just imagine it! We think we can see the two armies drawn out in battle array. A fair field is before them, the ranks are formed, the positions are taken, the great guns unlimbered. General Scott is just about to give the order to fire, when an aide comes up and respectfully reminds him that "the war is to be conducted on Christian principles," and that it will not do to fire.

"Very true, very true," says the commander-in-chief, "but what are they? I have read Vauban and Scheiter and Turenne and Coehorn. I have read the lives of the old conquerors, and have studied the campaigns of the greatest soldiers; but I never happened to come across these principles in any work upon the military art. Do you know anything about it, Colonel?"

"No."

"Nor you, Major?"

"Nor I either."

"I really don't know how to begin. I suppose it would not do to shoot. Suppose we send for the Chaplain."

The Chaplain arrives.

"Do you know anything about this fighting on Christian principles?"

"Oh, yes! it is the easiest thing in the world."

"Where are the books?"

"Here,"

And the Chaplain takes out the Bible.

"Really," says the General, "we ought to have thought of this before. It is a bad time to commence the study of tactics when the enemy is right before us; but I suppose we are bound by the treaty. What is the first thing, Mr. Chaplain?"

"Thou shalt not kill. Thou shalt love thy neighbor as thyself."

"But these are not neighbors. They are Mexicans."

"The same book tells us, a little further on, that the opportunity to do good to a man makes him one's neighbor."

"Will you go on, Mr. Chaplain?"

"Love your enemies. Do good to them that hate you. Pray for them that despitefully use you. If a man smite you on one cheek, turn to him the other."

"But while we are praying for the Mexicans, they will be firing into us."

"No, they are bound by the treaty also. It works both ways."

"Then what is the use of our arms?"

"This is all provided for in the same book. Beat your swords into plowshares and your spears into pruning-hooks."

"Then I don't see that there is anything for us to do here."

"Nothing, unless you send over and ask Santa Ana if he needs anything in the way of medicines or provisions or clothing. I rather think the treaty requires this of us.

"And I don't know but we ought to send them a few schoolmasters, for I understand that they are shockingly ignorant people."

"But how do you ever know which party conquers in this fighting on Christian principles?"

"That is the great beauty of it. Both sides conquer, and there are never any killed or wounded."

I presume this good woman will furnish you as many as you want of the above, free of charge. If you wish to send her some stamps or something more, I am sure it will be all right, because I think she told me she had but little means.

Let me now give you another illustration from my own experience. It was given in GLEANINGS years ago, but it will be new to most of our readers, probably, of the present day.

At the time of my conversion, something like forty years ago, I was, I am sorry to say, in pretty close touch with several prominent skeptics. After my conversion a difficulty or controversy had arisen between myself and the editor of our county paper. No doubt I was more or less at fault, because I was new in Christian work. He seemed to feel bitter toward me because I deserted their ranks and started to follow, as best I could, our Lord and Savior. I tried in my humble way to return good for evil; but it seemed to provoke him all the more. In fact, in his position as postmaster of our town he succeeded in having GLEANINGS thrown out of the mails—that is, he made such a representation of it at Washington that I received notice it could not be mailed at journal rates. I shall always remember how he looked as I met him on the street one morning. Taking his cigar out of his mouth, and puffing a cloud of smoke up toward the blue sky, he said:

"Mr. Root, I think now you will have to buy a lot of postage-stamps."

There was a twinkle in his eye as he said it. I do not know how it is now; but at that time the postmaster had a percentage

on the number of stamps he sold. I need not take time to tell you that, in answer to my little prayer, "Lord, help!" before it was time for the next issue of our journal to come out, a message came from Washington that GLEANINGS had been reinstated. At different times he tried to do me injury; and when the report came out in the papers that the great yields of honey I had been bragging about were produced by feeding glucose, he, it seemed to me, made it harder for me to prove my innocence of the charge. Things went on in this way for years. As our industry developed, and we were sending so much stuff by mail, in the course of time there was talk of increasing the salary of our Medina postmaster; and as the Department ascertained that our establishment was furnishing the great bulk of the mail business to our town I was appealed to, and I think I was also asked if I would recommend the present postmaster and ask for a corresponding increase in salary. In other words, had the postmaster in the past worked in harmony with our business in sending goods all over the world? At this crisis it was a little humiliating for my old enemy (if I may call him such) to come to me and ask a favor. As nearly as I can remember, his words were something like this:

"Mr. Root, there is no longer any need that you and I should be at swords' points as we have been in the past. If we turn about I can help you and you can help me; and I greatly need this increase in salary; and I assure you I will do the best I can to accommodate you in every way in your great and growing business."

I did not answer right away. Here was a grand opportunity for "paying back" or "getting even." Past things that I had patiently and uncomplainingly suffered came up before me. Satan suggested I should tell the postmaster that I preferred to recommend somebody else for his office. Then, again, that expression of his, "swords' points," came up. These "points" were all on his side, for God knows I had, year in and year out, *tried* to "do good to those that hate you." I do not think it took me very long to decide, however, that here, at last, was a chance to heap some coals of fire. I smiled, and looked him pleasantly and squarely in the face and said something as follows:

"Mr. ——, I for one shall be very glad to have pleasanter relations between you and me than they have been in years past."

Then I signed the papers. From that time on there were no more clips in regard to A. I. Root and his fanatical methods; and my good friend was, I think, a little less bitter toward the Bible and Christianity. Later on, his health failed; and finally there came a message that he had not many hours to live, and he wanted to see me. Imagine my joy and surprise to hear him say he had been reading his Bible, and had accepted his Savior as the Lamb of God that taketh away the sin of the world.

Now, dear friends, please do not think I am boasting when I say that this man was saved, not by what I *said* to him, but by the way in which I had succeeded (in my poor humble way) in illustrating the truths of the gospel I was trying to spread abroad to all men. It was my *action*, the way in which I *deported* myself under fire, that recommended the dear Savior, and not what I had said..

And now in closing let me say to you, dear friends, whose eyes rest on these pages, that you can do a greater work, perhaps, by your acts and daily conduct than by anything you can say. Let the whole world see that you are ready and on the alert to love your enemies and to "do good to them that hate you."

Let me close with still *another* clipping from our good friend Ridgeway, in the *Sunday-school Times:*

There is nothing better to be said of a citizen and neighbor than that he was a good man. Not great, not learned, not able, not rich, but *good*. Greatness falls, learning rusts, ability wanes, riches fly, but goodness goes on forever. The good man is, first of all, a God man. Good and God are words with the same mother. The good man is kindly, generous, helpful, thoughtful. When he speaks and promises, no one asks a writing. Such men are the regular standard output of those manufactories called Sunday-schools.

"CAST THY BREAD UPON THE WATERS, FOR THOU SHALT FIND IT AFTER MANY DAYS."

The letter given below was one of my "happy surprises," and it brought to mind the beautiful little text I have chosen for the head of this article.

A KIND WORD FROM C. G. TRUMBULL, EDITOR OF THE SUNDAY-SCHOOL TIMES.

My dear Mr. Root:—Last week I returned from a western trip, having the privilege of speaking at a dozen meetings in Kansas, Nebraska, and Iowa, on the subject of the Victorious Life—victory by faith in Christ.

On my way home I was breakfasting one morning in a railroad station, and my appetite was appealed to by the mention of an article on the menu served with "strained honey." I ordered it; and as I was eating the honey I wondered idly whether there was any real honey in it, or whether it was simply a manufactured and artificial product, of which we are told there are so many masquerading under natural names these days. It tasted all right; but I was rather inclined to think it was being "put across" on me, and I picked up the little "individual service" bottle containing the honey, and glanc-

ed carelessly at the label. I didn't notice the whole label closely, and set the bottle down again.

I enjoyed my honey, whether real or not, however; and a few minutes later I looked at the label again, this time more closely. Imagine my surprise and delight as I saw printed across the bottom of the label, "A. I. Root, Medina, Ohio."

"There's no counterfeit *there*, if A. I. Root's name is on it," said I to myself; and I felt as tho I had run across an old and a warm friend on my journey. Instantly I recogninzed that I had before me the *real* thing, from a man who was a *real* man because Christ is in his life.

I just wanted to pass on this bit of travel experience to you, and to thank you for having made my breakfast more enjoyable. You have brought honey into my life over and over again by your wonderfuly appreciative and encouraging words about the *Sunday School Times*.

With warm and grateful greetings, believe me,
Yours in His faithfulnss,

Philadelphia, Pa., May 15. C. G. TRUMBULL.

The above suggests several things—first, that the dining-room menu still persists in saying "strained honey." It has been something like fifty years since I helped to give the world the honey-extractor, which enables us to get the honey out of the combs in a much better and purer form than squeezing or straining it out. Secondly, our good friend Trumbull, with a great lot of other people, does not seem to recognize that our pure-food laws have for several years past pretty much done away with the adulteration of honey as well as other things. There is quite a penalty imposed for adding glucose or any other similar substance to liquid honey, and I believe the law is pretty well enforced. I hardly think a spurious article can be found now in our groceries nor in the drugstores of the United States. No doubt my good friend Trumbull has paid me a higher compliment than I deserve; but I decided to let it go in print because it so well illustrates that any man or woman who persistently *tries* to be honest and to do right before God and man, year in and year out, will ultimately get the promised reward. The bread cast on the waters will not be lost.

SUNDAY'S EVANGELISTIC WORK IN BALTIMORE.

In the Home paper in our issue for Feb. 1 I said nothing would save Baltimore except a visitation of the Holy Spirit, and that I finally knelt down and prayed that the Lord might call Billy Sunday to that terribly wicked city; and I learned afterward that he had already arranged to go there. I have space to give only a brief statement in regard to the result. The Baltimore *American* for April 24 has quite an article in regard to the last day in the great tabernacle. A large number of converts, about 23,000, were gained, which, if I am correct, exceeds all former records, according to the size of the city. It is a wonderful achievement. It comes pretty close to being one in 25 of the whole population. While he was preaching his closing sermon to a vast audience of the people, *another* meeting was held, and addressed by Charles A. Windle and Jacob E. Meeker. These two great defenders of the liquor business of course had no end of fault to find in regard to the harm that Sunday's earnest preaching had done to the "booze business." Over a million and a half people listened from first to last to Sunday's preaching in Baltimore. At the farewell sermon 914 came forward.

After the above was in type I found the following in the *American Issue:*

On the closing day of the Billy Sunday campaign in Baltimore, the evangelist talked to 100,000 people, and the leading newspaper of the city the next morning gave 18 columns of space to the tabernacle meeting. On the same Sunday both Windle and Meeker spoke at a meeting in Baltimore to about 2000 people, and the same paper gave the wet meeting a half-column space.

This shows how the people of Baltimore felt about the Sunday meetings in comparison with the meeting held by the wets.

LEARNING TO SWIM.

Again and again are we confronted with a newspaper clipping telling of boys and girls being drowned who might easily have saved themselves if they had been able to swim but a little. A person who cannot swim, if thrown into the water where he comes within a foot of reaching a support may drown helplessly because he is unable to move his body just that one foot. In fact, I myself would not be here writing these notes were it not that I had just a little practice in the art of swimming sixty years ago. I was vividly reminded of it by the following from the *Plain Dealer:*

TEACH PUPILS TO SWIM; CHICAGO EDUCATORS URGE COURSE BE ADDED TO CURRICULUM.

CHICAGO, Aug. 13.—Members of the committee on buildings and grounds of the board of education today adopted a resolution recommending the teaching of swimming in every public school.

A special committee, of which Mrs. Ella Flagg Young, superintendent of schools, is chairman, was appointed to work out the practical details of the plan.

It is estimated it will cost the city about $1,000,000 a year to add swimming to the curriculum in every school. The steamer Eastland disaster led to a consideration of the subject by the committee.

No matter if it does cost a million dollars a year or more to teach our children to swim as well as to read, write, and spell, let the good work go on; and I am especially pleased to note that the capable and talented woman mentioned in the above is to have charge of the matter.

TEMPERANCE

"BOOZE" ADVERTISEMENTS IN OUR CITY DAILIES, ETC.

We clip the following from the *Ohio Farmer* for May 13:

A report just issued by the Bureau of Chemistry, United States Department of Agriculture, covering food-law cases judged since April 20, 1915, lists over 60 patent medicines as misbranded and fraudulent in that their analyses prove that they contain no elements to effect the cures or relief that their labels claim. The list includes baby soothing-syrups, which are pronounced positively dangerous on account of the opiates and alcohol that they contain; and, furthermore, in the words of the government decisions, the label claims are "false and fraudulent in that they are applied to the said articles knowingly, and in reckless and wanton disregard of their truth." This is the season when many people's minds dwell on taking "spring tonics" and "bitters" as relief for the lassitude resulting from diets unsuitable for the warmer weather. True, we do need the tonic to be obtained in the mineral salts of herbs and fruits, but it is far wiser and more effective, and also much cheaper, to get it in fresh green herbs and such fresh fruits as are obtainable now. A daily "mess o' greens"—we had a most appetizing dish of dandelion greens for dinner yesterday—will do you far more good than any of the "bitters," tonics, and nerve remedies advertised so liberally in your local newspaper. Whatever herbal efficiency there is in these is usually so doped with alcohol that the harm done outweighs the good that the herbs alone could do. Therefore it is far better for your health and your purse to take your "yarbs" and your iron, potash, lime, and sulphur first hand and directly in the fresh green vegetables, fruits, eggs, and milk. Spinach, dandelion greens, and raw cabbage are much more effective sources of iron than any beef, wine, and iron compounded in a bottle from the drugstore.

Just a word about dandelions before we take up the matter of liquor advertisements. I am glad to see a good word for dandelions, especially since so many people talk about dandelions as they did a few years ago about sweet clover. Dandelions are not only a splendid crop to plow under to enrich the ground, but they are excellent cow feed. When you find a cow that will not eat dandelions you may make up your mind that her education is lacking, just in the same way you decide the education of an editor is lacking when he gives place in his columns to booze advertisements.

Now in regard to fraudulent medicines. We are informed there is a law against palming off on the public misbranded bottles with an exaggerated statement as to the virtue of the contents; or, worse still, selling something that is not a remedy at all for the trouble specified. And, by the way, it rejoices my heart as I go over the agricultural periodicals sent out from our different states to notice the splendid sentiment coming from the different editors in regard to everything harmful to the inmates of the homes on the farm. May God be praised for our splendid agricultural periodicals. There are few of any kind nowadays, except our great city dailies, that will accept any sort of booze advertising. In our issue for Feb. 1 I said I had been pained because our neighboring city of Cleveland seemed to be the only large city that did not contain a daily having the courage to say that no more whisky advertisements would be found in their columns. If I am making a mistake, please correct me. It is true, however, that our old *Plain Dealer,* sometimes for a week or ten days, will have no whisky or beer advertising whatever; but just when I begin to rejoice, then comes something like what I saw a few days ago—a booze advertisement that had the cheek to claim their beer was "liquid bread." One of the great dailies, if not the greatest in the large city of New Orleans, has just stepped over on the dry side. See the following from the *American Issue:*

It is announced that the *Times-Picayune,* of New Orleans, which heretofore advertised liquors, is to join the ranks of newspapers which refuse such advertisements.

But here comes something from our beloved Florida that does not call for rejoicing. I clip it also from the *American Issue:*

THE "GREATEST OFFER EVER MADE."

Who says that the liquor-dealer is always lacking in a sense of the eternal fitness of things? In support of the contention that he occasionally is consistent we cite an advertisement which appeared recently in a Florida newspaper (the *East Coast Advocate,* Titusville), in which the "greatest offer ever made" is set forth. This offer consists of a box of 50 cigars, with a claimed value of 7½ cents each, for $3.48, and with each purchase will be given a premium of *one quart of whisky and a revolver.* The cigars are evidently a mere incident. But what could be more consistent than a bottle of whisky and a revolver?

When one reads the above he is tempted to wonder if it is possible a periodical could be found *anywhere* whose editor is so far behind the times that he would accept such an advertisement. The bottle of whisky with the cigars *might,* in one sense, be consistent; but why in the world should the revolver be put in? Is it the hope or expectation that, after the purchaser has drunk the whisky, he will shoot his wife or children, and then in his drunken craze use the revolver on himself? Do we need any *more tragedies* along that line than we have already? By the way, is there no law, either in Florida or in the United States that will put a stop to such kind of advertising as well as that sort of gift or prizes offered as premiums? Instead of sending mission-

aries to the heathen, why not open up a crusade to educate some of our country editors?

THE DRUNKEN CHAUFFEUR, THE MAN WHO SOLD HIM THE DRINK, AND THE JOURNAL THAT ADVERTISED THE DRINK.

We clip the following from the *American Issue:*

WHO ARE THE GUILTY PARTIES?

A drunken man in Detroit was driving an automobile and ran over a man, killing him. The driver was arrested, convicted, and sent to the penitentiary for 15 years. The fact that he was drunk when the accident occurred did not save the man from punishment.

The *Ohio State Journal,* commenting on the case editorially, says: "For a man who is drunk to run a car is an offense itself; and when he happens to kill a man, the offense naturally intensifies the crime. If there is anything the law should punish severely, it is where a drunken man undertakes a run an automobile."

But what about the men who made and sold the liquor which made the man drunk and caused the killing? Are these men guiltless?

And what about the newspaper that in its advertising columns urges men to drink? In the same number of the *Ohio State Journal* in which the editorial appears is an advertisement to the effect that a certain brand of liquor is "worthy of a place in the best of society, is good for young and old, and is a good tonic of high value."

In the same paper of the same date another brand of liquor is proclaimed to be a "spring tonic, a delicious drink, and an ideal thirst quencher."

Probably the drunken automobile driver who killed the man had been reading these advertisements.

Is the drunken automobile driver the only guilty party?

What does the *Ohio State Journal* think about it?

I hope the above will be read over and over, not only by drinking men, but by those who vote for drinking men; those who vote wet, and the editors of the periodicals that accept wet advertising.

PROHIBITION DOES NOT CONFISCATE PROPERTY, AFTER ALL.

We take pleasure in clipping the following from the *Methodist Temperance Bulletin:*

SALOONS AND BREWERIES TURN TO LEGITIMATE BUSINESS.

"Hydes," the finest saloon of Seattle, has been remodeled as a tea-room, with beautiful decorations, oriental furnishings, and comfort conveniences. Hundreds of Seattle's leading women are its patrons.

Prohibition does not confiscate property, but merely forbids its misuse.

The Raymann Brewery, of Wheeeling, West Virginia, is now the P. O. Raymann Company, engaged in meat packing.

The Uneeda Brewery, of West Virginia, is now a milk-produce company.

The Benwood Brewery (West Virginia) is now a chemical and soap plant.

The Fairmount Brewery (West Virginia) is now an ice and milk products plant.

The Huntington Brewery is now a meat-packing plant.

The Cedar Rapids Brewery is now a yeast-factory.

The Iowa City Brewery is now a creamery and produce company.

The Star Brewing Company, of Washington, Pennsylvania, is now the Capital Paint, Oil, and Varnish Company.

The North Yakima Brewing Company, of Washington, is now a fruit by-products company.

The Salem, Oregon, Brewery, is now making logan-berry juice.

"PREPAREDNESS," NOT AGAINST AN IMAGINARY FOE, BUT AGAINST A REAL ONE.

We learn from the *Patriot Phalanx* that Gen. Nelson A. Miles, in his speech in Washington, D. C., said:

The proper "preparedness" should be, not against an imaginary foe, but against the ever present enemy that is destroying more American men and women and homes than any foreign foe could ever do.

Can't a lot of us say amen to the good old general's declaration?

GOD'S KINGDOM COMING IN SOUTH DAKOTA.

We clip the following from an article in the *New Republic:*

MITCHELL, S. D., April 21.—The greatest dry victory ever won in South Dakota was achieved last Tuesday when a score of towns and cities now wet swung into the dry column, and every dry town remained dry. . . . . Three cities not only refused to go back to the saloon system, but increased their dry majorities of a year ago—Aberdeen from 4 to 66; Mitchell from 102 to 240; Rapid City from 43 to 134.

"THE MILD AND UNASSUMING CIGARETTE."

We clip the following from an article in *Plain Dealer:*

ATTENTION, HENRY FORD; AMERICANS THIS YEAR PROBABLY WILL SMOKE 21,000,000,000 CIGARETTES.

NEW YORK, May 11.—Bitter news for the Carrie Nations of this land is contained in a report compiled by the Wall Street *Journal* and made public today. It concerns the mild and unassuming cigarette of which so many harsh words have been said by well-meaning persons.

The report shows that if American smokers continue using cigarettes thru the year at the rate they have for the first three months the total consumption for 1916 will be well over 21,000,000,000.

The increase in consumption for the first three months of 1916 in the United States and Kansas over the same period in 1915 is 1,484,000,000. The total consumption last year was 18,000,000,000.

Our nation is just now making a big war, and, by the way, in many respects a troublesome war, on habit-forming drugs. All things considered, is there a *worse* "habit-forming drug" at the present time than the cigarette? Let our nation (and every other nation, for that matter) answer. Are we to understand from the above that the *Plain Dealer* considers cigarettes "mild and unassuming"? and also that Ford and Carrie Nation and other people who stand with them on the cigarette business are only half-crazy fanatics?